OFFICIAL PUBLICATION OF THE PROCEEDINGS AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

MARCH 6, 1950
VOLUME 39, NO. 5

AMERICAN DYESTUFF REPORTER

DEVOTED TO TEXTILE CHEMISTRY • BLEACHING • DYEING • PRINTING • FINISHING

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Workhorse for the Spring Season

(WITHSTANDS UREA FORMALDEHYDE RESIN AFTERTREATMENT)

Browns are indicated as the colors for Spring. A review of the Direct Browns available for Viscose Rayons and mixed fabrics shows

DIPHENYL BROWN BBN EXTRA

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A rich, neutral shade, it is desirable not only because of its wide range (from beiges to dark browns), but for its solubility and extraordinary ability to dye level under the most extreme conditions. Additions may be made at high temperatures regardless of the quantity of salt present in the dyebath without fear of unevenness.

In Urea Formaldehyde Resin Aftertreatment

1. Shade and light-fastness are undisturbed.
2. Wash-fastness is appreciably improved.
3. On Spun Viscose Rayon Gabardines and Twills level, desirably fast-to-light dark browns are undisturbed.

Fabrics tending to form *sharp creases* and folds are dyed level; solubility and level dyeing properties make it useful for Cotton piece goods on pad or jig; Cotton and Viscose Rayon are dyed practically a solid shade; *Acetate effects* while not entirely reserved, are stained unobjectionably in most cases—cross dyeing is definitely possible.

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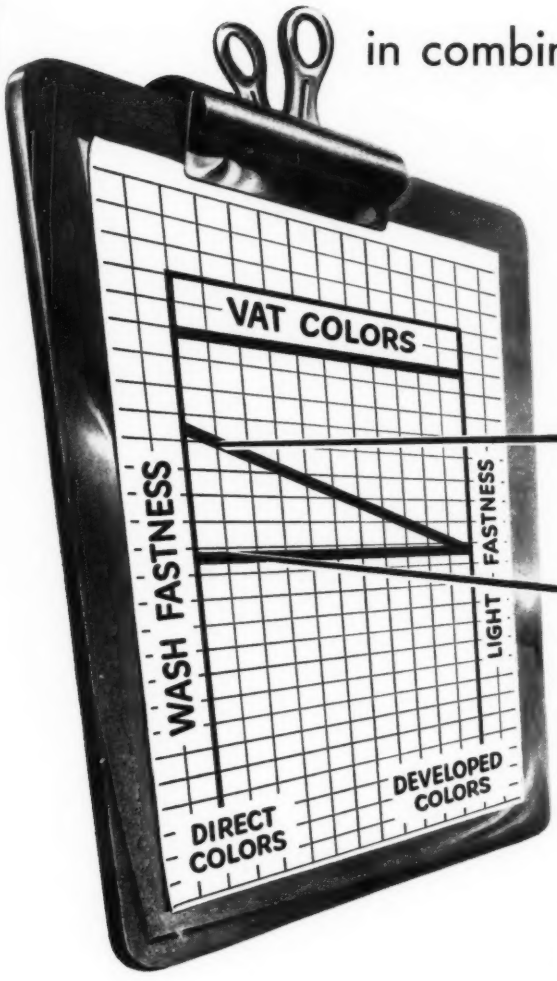

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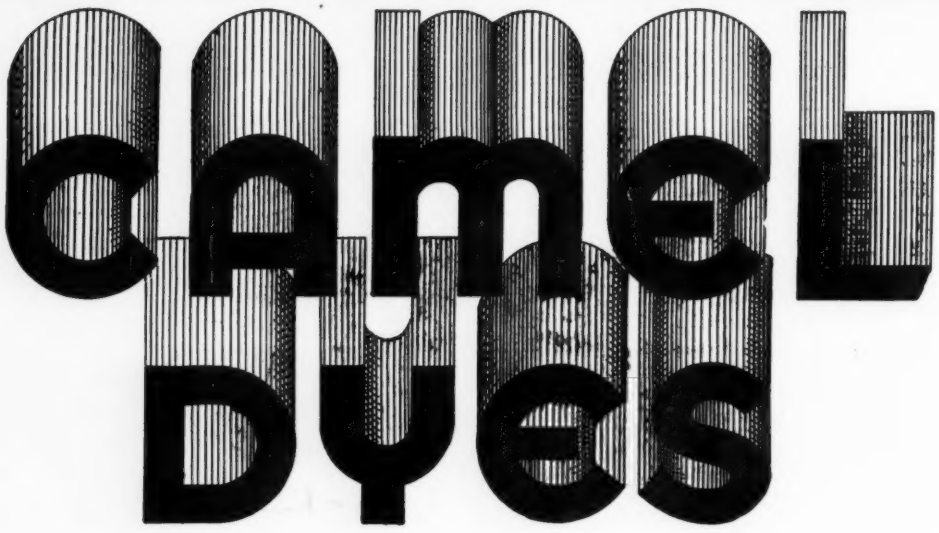

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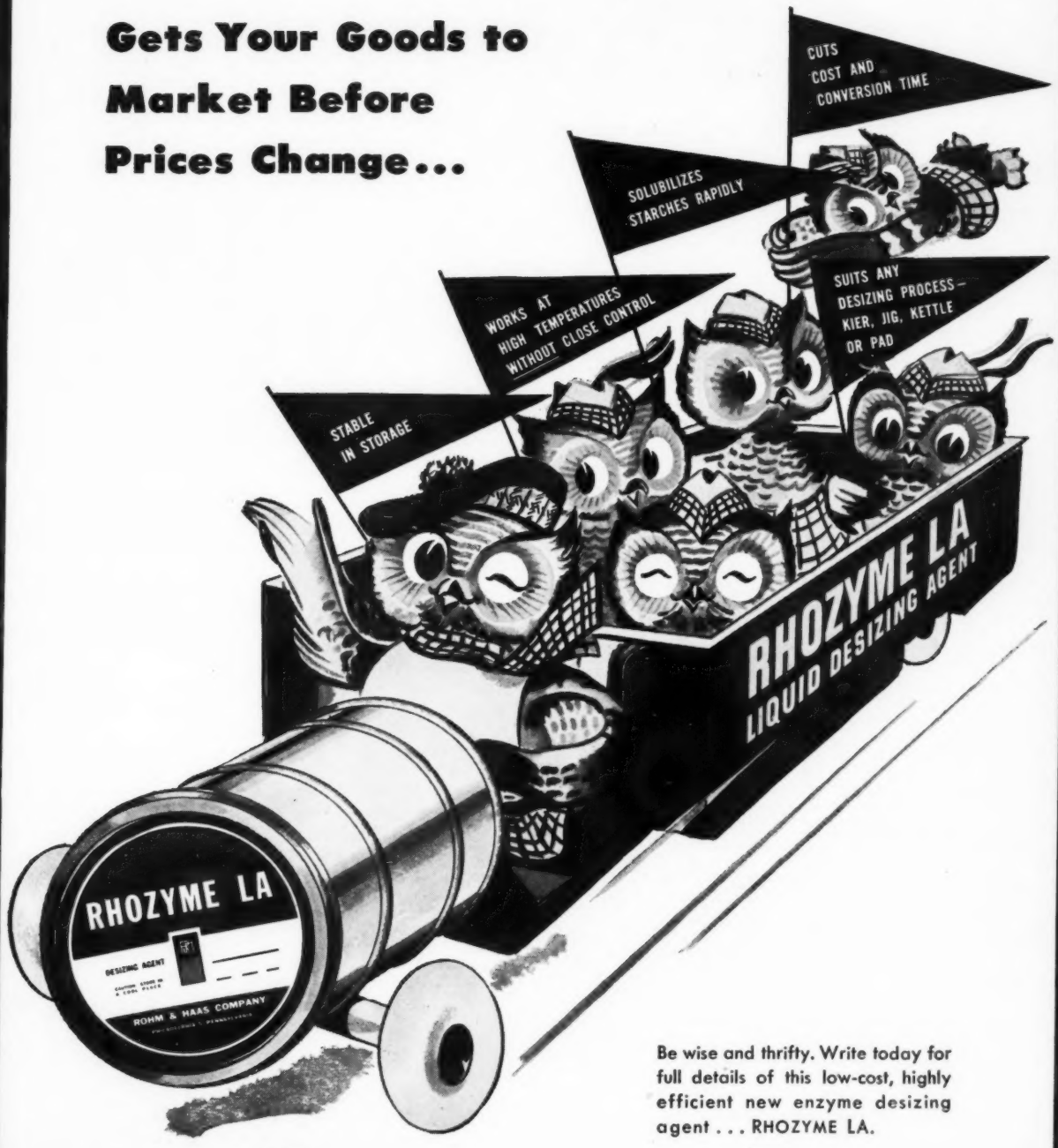
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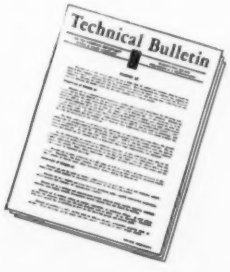

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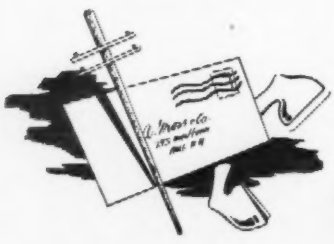

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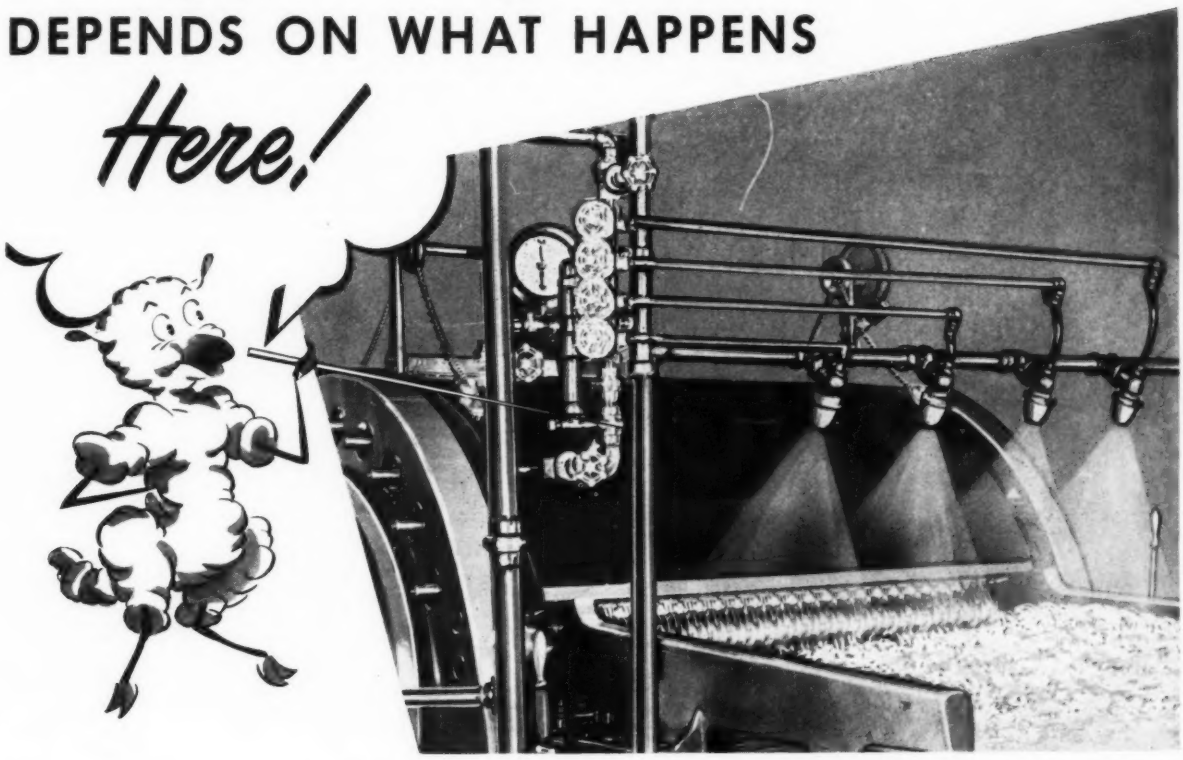

Leading woolen mills wisely select their wool oils with extreme care. The reason, of course, is that they know how much the oil's performance governs the success of the many operations which follow.

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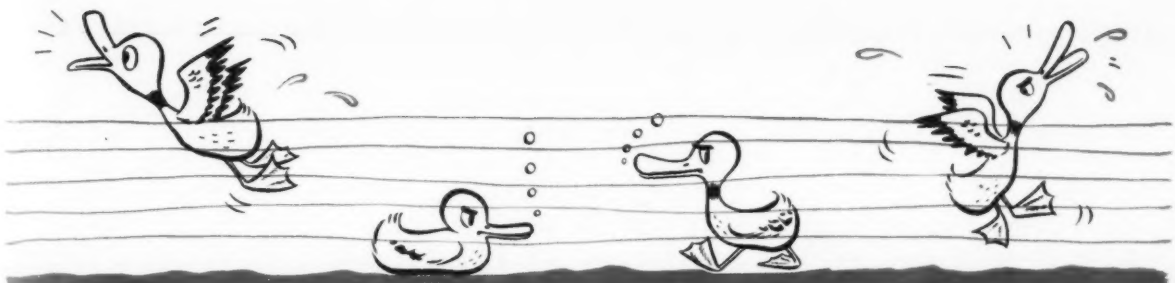

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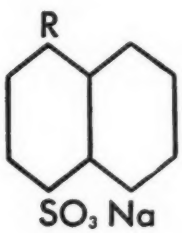

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SOROLENE G is a fast wetting agent with moderate foaming action and good dispersing properties.

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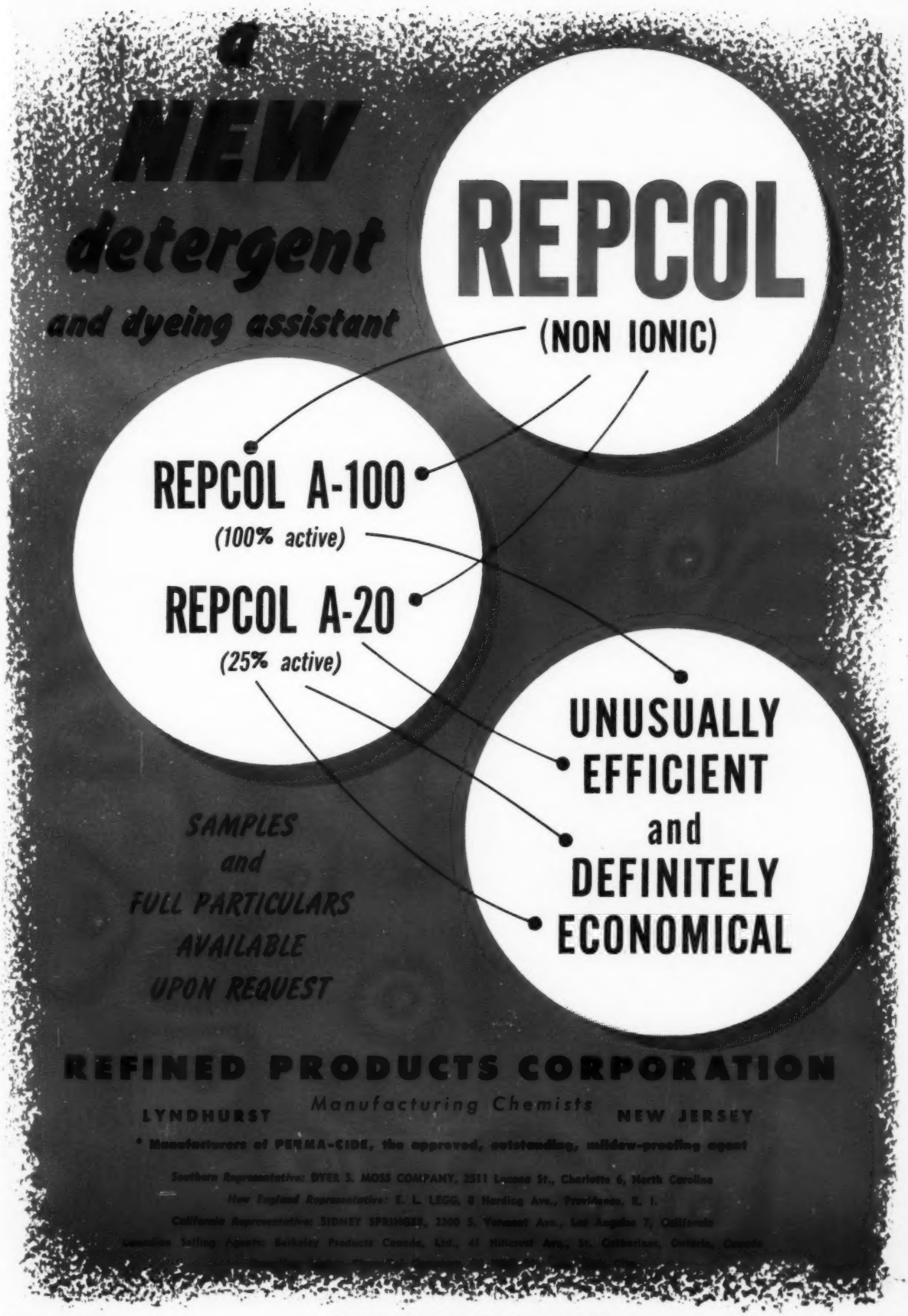
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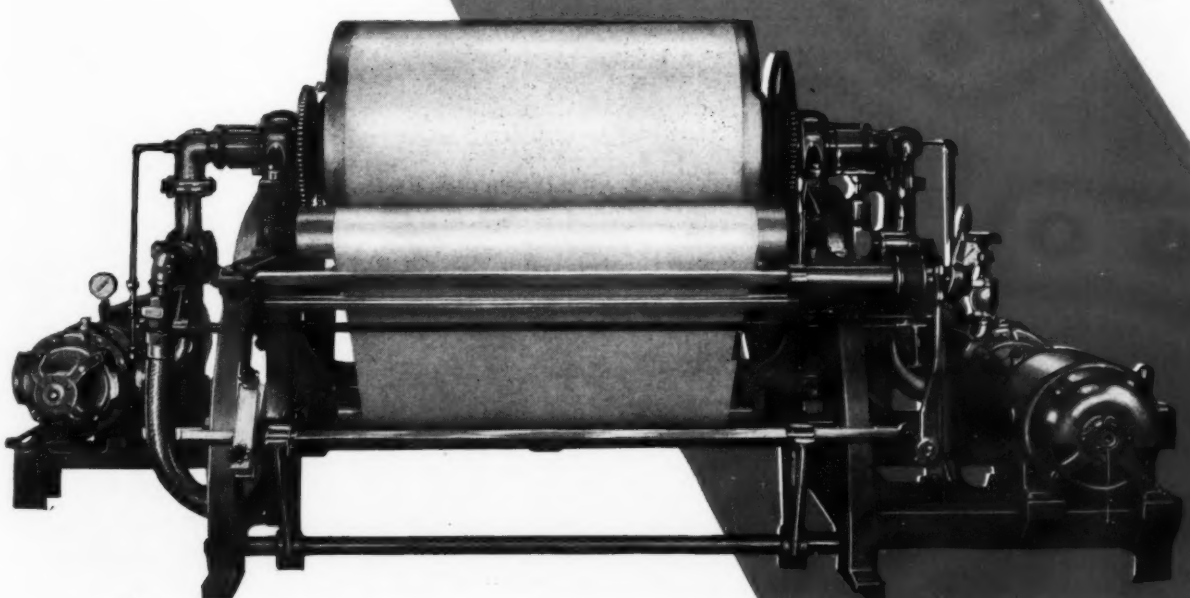

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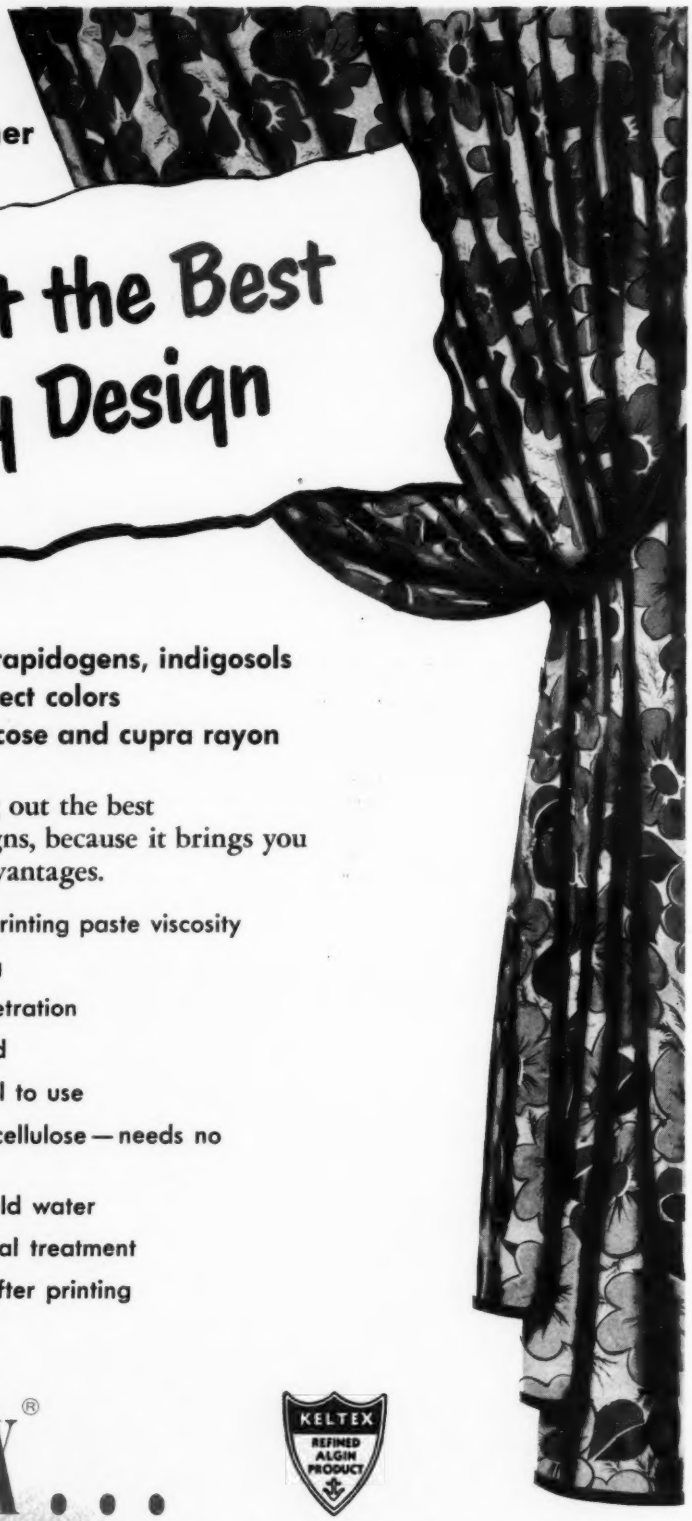

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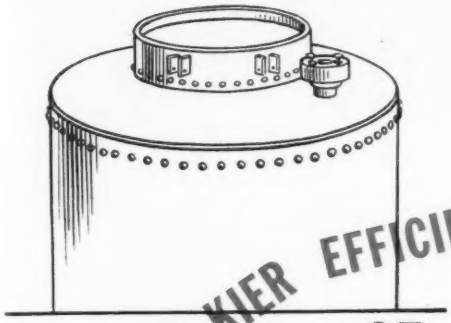

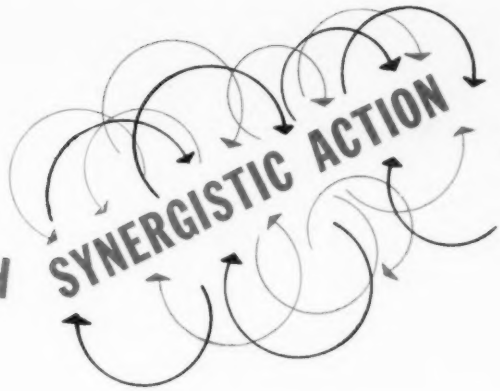

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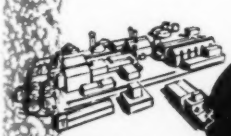

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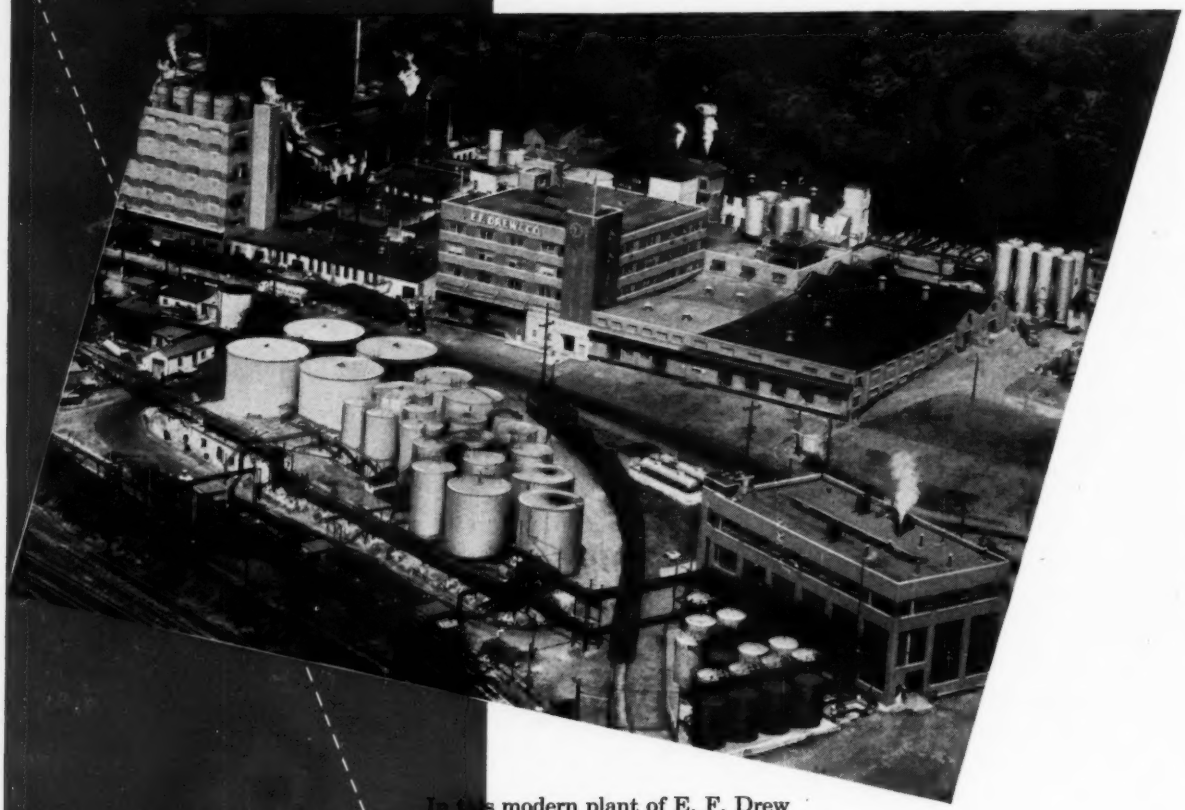

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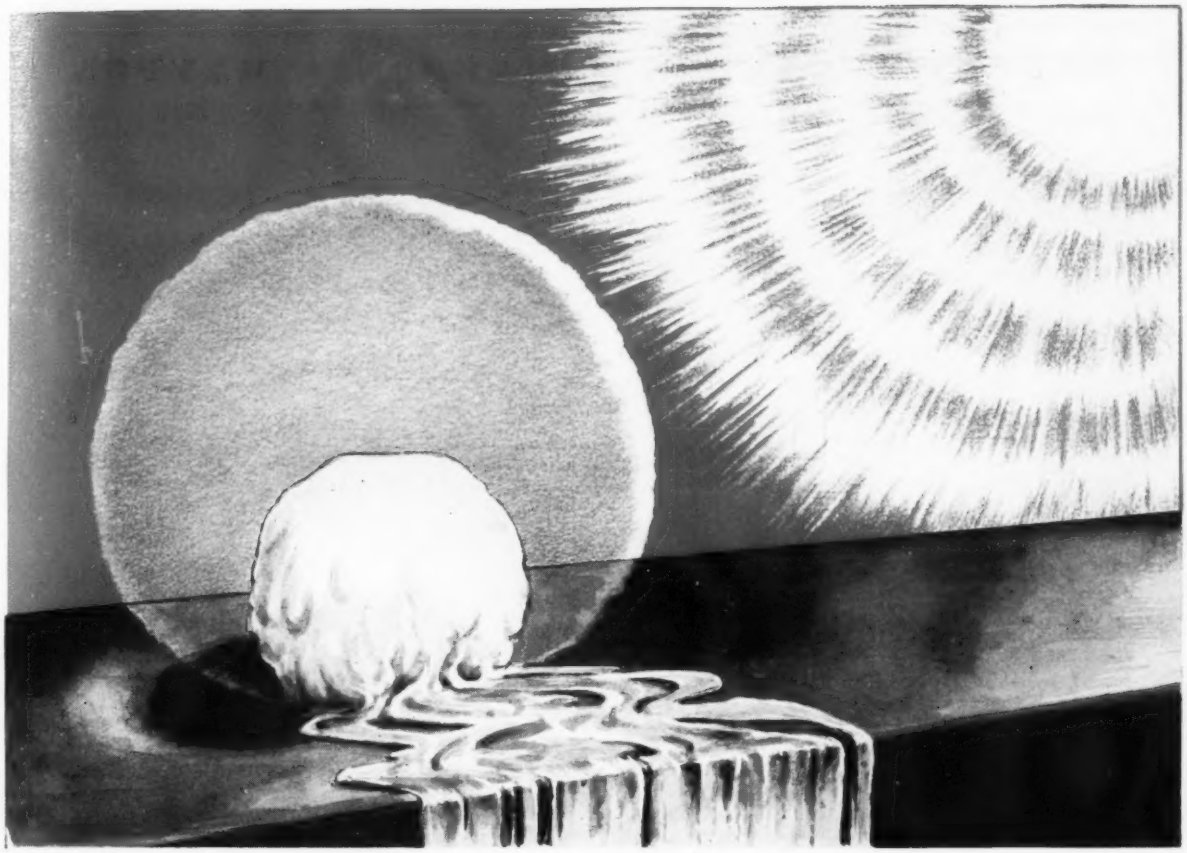

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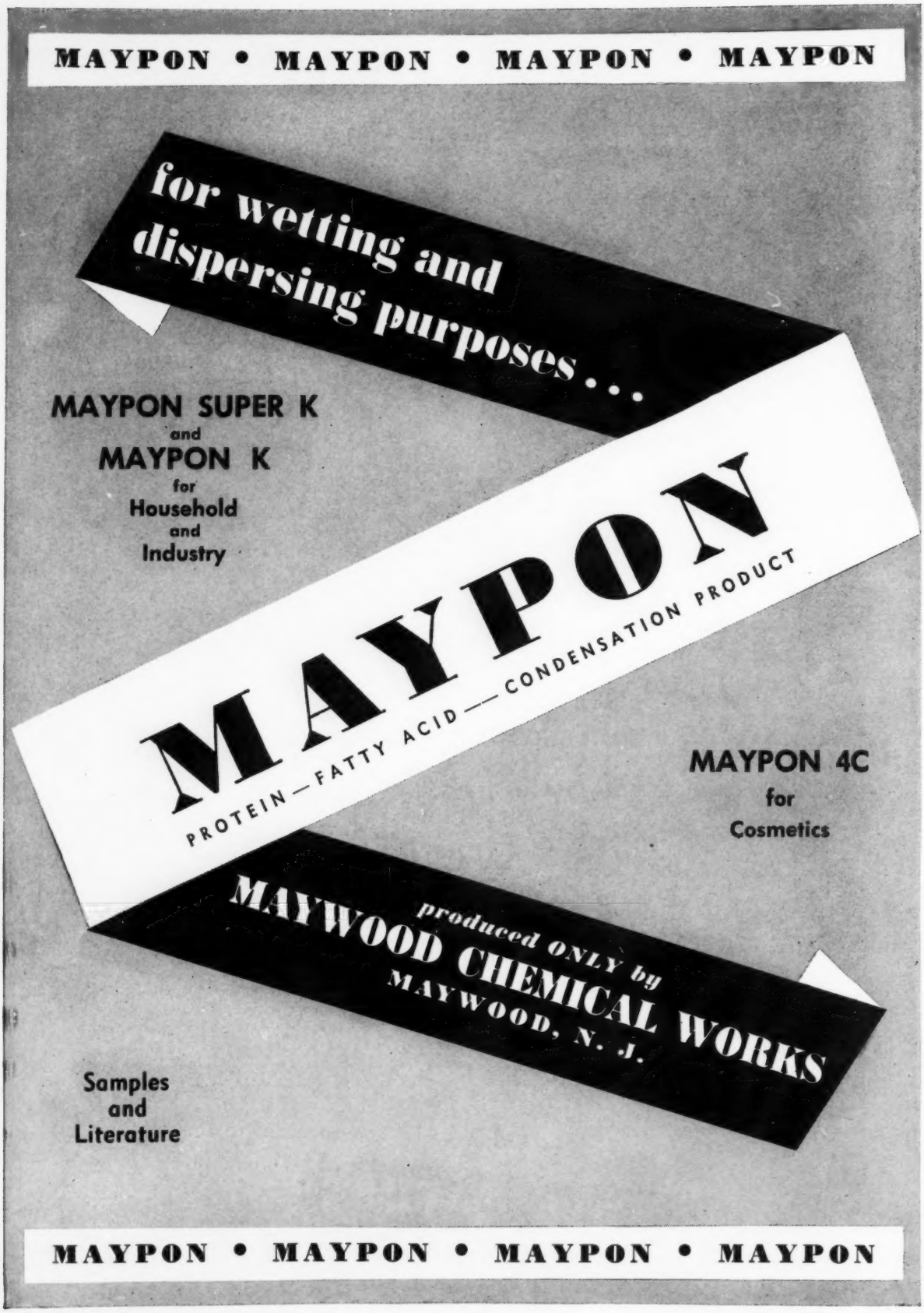
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MARCH 6, 1950
VOLUME 39 NUMBER 5

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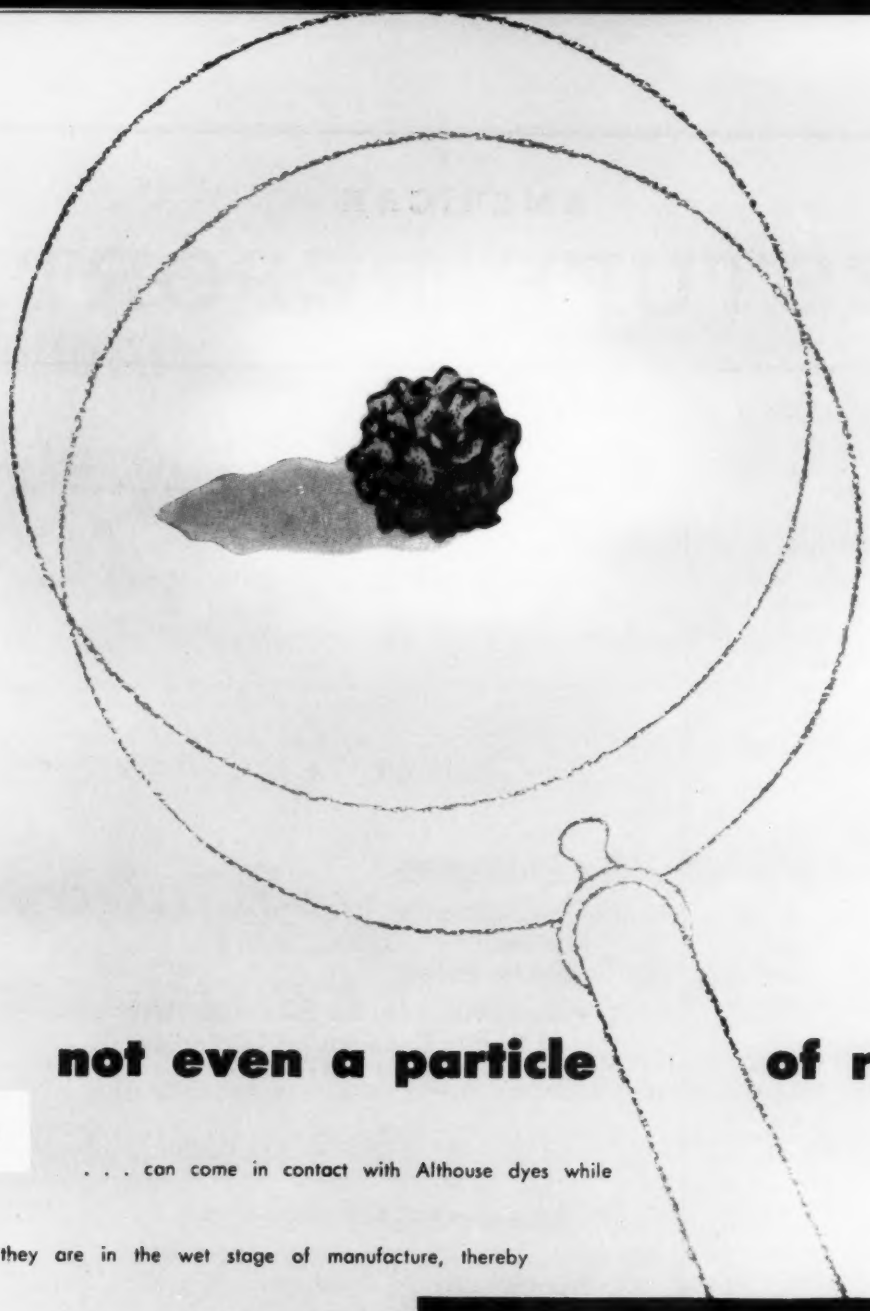

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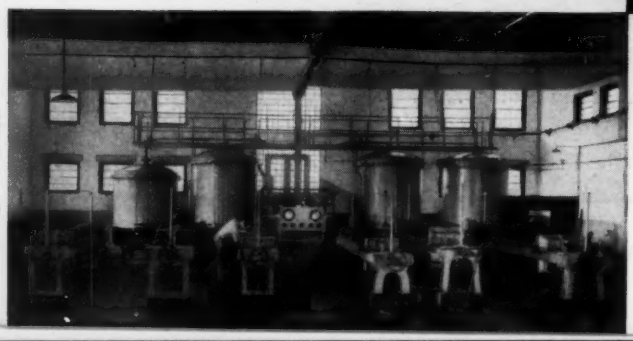

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LAUNDRY RESISTANT ANTIMILDEW TREATMENT

SAMUEL LEE
Interchemical Corporation, Textile Colors Division, Fair Lawn, New Jersey

THE protection of textiles against deterioration due to mildew and rot has become a subject of considerable interest both for military and civilian purposes. The armed services are steadily seeking higher standards of utility for textile products which, under battle circumstances, are often exposed to muddy or tropical conditions conducive to microbiological destruction. In civilian life, it can be a matter of considerable annoyance to enter a room after a period of high humidity and be assailed by the musty, moldy odor indicative of mildew development on drapery or upholstery fabric.

Numerous agents and methods have been proposed and utilized for the prevention of this deterioration due to microorganisms *(1)*. The common denominator of all has been their lack of permanence. Although intitially it is rather easy to obtain complete resistance to the development of such organisms, under the conditions of use nearly all such agents tend to disappear from the fabric or to lose their efficacy. Exposure to ultraviolet light, water-leaching, weathering or laundering removes applied protection and renders the fabric equally as sensitive to biological deterioration as the untreated material.

This is a report on a method for prolonging the permanence of antimildew treatments when applied to fabrics. It is the gist of this report that, compatible with textile requirements and at not too great a premium in cost, almost any degree of permanence of mildewproofing may be secured.

Rot and mildew of fabrics result largely from the growth of fungi and, to a lesser extent, of bacteria on the surface of textile fibers. Fungi are a low order of plant life and exist all about us—in the air we breathe, in the food we eat. Most are harmless, while some are quite beneficial, such as edible mushrooms and molds which product antibiotics. A few, such as toadstools, are toxic and some cause disease, such as *epidermophytosis* (athlete's foot). Probably their greatest function is maintaining the carbon cycle in nature. Every year, it is estimated, 3% of the carbon dioxide of the atmosphere is "fixed" by photosynthesis. If this were not restored, the atmosphere would soon be depleted of CO_2. As a result, vegetable life and its parasites would soon cease. Fungi, by digesting surplus vegetation, restore CO_2 to the atmosphere and balance the carbon cycle.

Not all fungi possess the faculty of digesting cellulose. Evidence is being accumulated *(2)* that, of the thousands of families or genera, each contains one or more species which can be nourished by cellulose. The American Association of Textile Chemists and Colorists *(3)* in tentative test method 30-46—"Resistance of Textiles to Mildew and Rot, and Evaluation of Textile Fungicides"—recognized two standard organisms, *chaetomium globosum* and *aspergillus niger*, for inoculation tests, as well as the soil burial test which may involve a mixture of innumerable fungi and bacteria.

Few generalizations can be made but the prime requirement for microorganism growth is water. Fungi spores may remain dormant for years in an environment of low moisture content and grow vigorously as soon as the humidity increases. The minimum requirements for growth have not been definitely determined. 7½% to 15% have been reported *(4)* as concentrations below which no fungal growth will occur.

The mechanism for the deterioration due to fungi has been the subject of considerable study and is now reasonably established. The spore accidentally falls upon the fiber and adheres. Under favorable conditions of humidity and temperature, it germinates. It secretes an enzyme, cellul*ase*, which attacks the cellulose at the anhydrogluconic linkage, hydrolyzing it to form glucose. This nourishes the fungus so that it divides and multiplies. If undisturbed, it grows in geometric ratio and eventually consumes all the fabric.

Recognition of mildew growth is relatively easy. The presence of a moldy odor is a reliable symptom of such development. Isolated colonies which usually grow into diamond-shaped discolorations are visual evidence of incipient mildew. As the microorganisms feed on the fibers, there is progressive loss in tensile strength and, eventually, decay proceeds to the point where complete penetration and disintegration of the cloth occur. Loss of weight by the cloth becomes another concomitant of mildew growth. Chemical viscosity tests have all but been abandoned as tests for mildew growth as being superfluous.

Four basic principles for the prevention of mildew and rot in textiles have been enunciated:

1. Destroy the organism.
2. Inactivate the enzyme.
3. Erect a barrier between organism and fiber.
4. Modify the chemical nature of the textile.

All the work described here belongs in the first category and will be discussed in greater detail.

Inactivation of the enzyme is largely of theoretical interest. It has long been known that specific chemical compounds, such as azides, iodoacetates and fluorides, are poisons for enzymes and are commonly used in biochemical work to stop or retard enzyme action. So far, there has been no practical application of this prin-

ciple.

There is a great deal of fascination in the concept of setting up a chemical barrier between the fiber and its environment, thus preventing access by the microorganism. Problems include maintenance of textile character and economic considerations. Spade work has been reported along these lines *(5)* using polymeric thermosetting resins, such as urea or melamine formaldehydes, in concentrations upwards of 15%.

The fourth method includes the topchemical procedure now being actively studied *(6)* as a method for simultaneously and by a single chemical reaction rendering cellulose mildew-resistant, flameproof, water-repellent and/or resistant to light. The surface anhydrogluconic linkages, when etherified or esterified, lose their susceptibility to attack by microorganisms. Acetylation and phosphorylation are receiving some recognition.

Destruction of the organism is man's oldest method of combating fungus depradiation. Agronomists have long been familiar with the protection of crops from fungi by the application of lime-sulfur and lime-bluestone (Bordeaux) mixtures. Almost a thousand different chemicals have been reported as exhibiting various degrees of effectiveness in the retardation of mildew growth in textiles. These may be largely classified into metal compounds and phenolics.

The phenolics have been widely recommended for mildewproofing ever since Lister propounded his theory of antisepsis. Homologs are still being intensively studied *(8)*. The major compounds in use now are pentachlorphenol, 2,2′-methylene bis-4-chlorophenol, and silicylanilide. Most of these compounds weather badly, leach out readily or have a slight vapor pressure so that in time they disappear through volatilization.

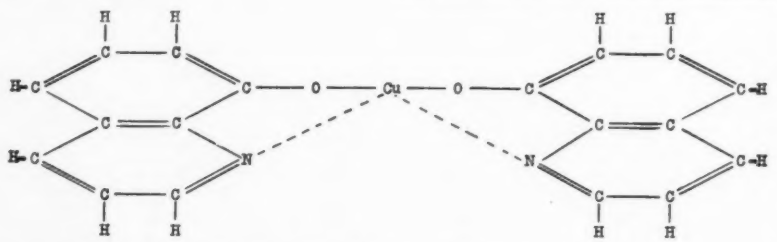
Of all the metal compounds evaluated, compounds of copper appear to have a specific toxicity for fungi without undue toxicity for animal life. Zinc and chromium compounds have enjoyed brief periods of popularity for this purpose, but it has been demonstrated that the order of their toxicity is relatively low. Mercury compounds possess high toxicity for both animal and fungal life, and a compound of this metal suitable for textile application is still being sought *(7)*. Since mercury compounds may be absorbed through epidermal contact, their use is precluded for any textile material that is handled by humans. Cost-wise, they will always be more expensive than copper compounds.

It is generally accepted that the efficacy of all copper compounds is due essentially to their copper content. The copper must be in an available form, however, as indicated by unsuccessful attempts to protect fabrics by interweaving strands of copper throughout the cloth. Copper oxide has been found very effective as the antifouling component in surface finishes. Soluble copper compounds are unsuitable, of course, as they would disappear in the first rain. Of the insoluble compounds used for the protection of textiles, the traditional one in the past has been the copper soap of naphthenic acid *(9)*.

The naphthenic acids are cyclic, saturated organic acids which are by-products of petroleum refining obtained when the alkali liquor from the caustic treatment of gas oil is acidified with sulfuric acid. Its color is improved by redistillation. Copper naphthenates are applied to textiles from a solution in a petroleum solvent which is not recoverable after application and increases the cost of application. They are fairly resistant to leaching and light. Other copper compounds including hydroxynaphthenate, oleate, stearate and ammonio-fluoride have been used to some extent, but none completely met the overall requirements of permanence.

Chelate compounds are combinations of metals with other material in which a salt is not formed, and the metal is attached to the rest of the groups by a coordinate linkage instead of the usual electrovalency. Hemoglobin is a common example of a chelate compound of iron with a complex organic molecule. Chelate compounds of copper with various organics have been the subject of a recent study *(10)*, after the compound of copper and 8-quinolinol had been reported to be one of the best antirot and antimildew agents available *(11, 16)*.

Copper-8-quinolinolate, also known as copper-8, the copper compound of 8-hydroxy quinoline, or Milmer, is a yellowish green powder with the following structural formula:



It has a molecular weight of 351.83 and contains 18% copper which is firmly bound by both primary and secondary linkages. It is quantitatively insoluble in both acid and alkali within the pH range of 2.7 and 12. It is soluble in water to the extent of 0.8 parts per million and is practically insoluble in all common organic solvents. Its vapor pressure and volatility are zero and it is stable up to 400°F. It has a low toxicity for higher animals and a high toxicity for lower organisms. It is not a primary sensitizer nor have any cases of skin irritation on contact been reported.

Several methods have been proposed for the application of this agent to textiles *(12)*. The earliest procedure suggested was the so-called two-bath process, wherein the cloth was first immersed in a solution of 8-quinolinol acetate, followed by padding through a solution of cupric acetate. The chelate copper compound was precipitated on the surface of the fiber but, since no substantivity exists between the two, no fastness was obtained. Subsequently, it was recommended that it be applied from an organic dispersion with a chlorinated cyclic hydrocarbon as the binder or from a water-in-oil emulsion with the binder based upon a cellulosic ether. Permanence was somewhat improved but application from an organic system involving high concentrations of organic solvents was undesirable. A water system is also mentioned wherein the binder is methyl cellulose, insolubilized with water-soluble melamine formaldehyde, but results have not been uniformly satisfactory.

The success and growth during the past decade of resin-bonded pigments *(13, 17)* for textile decoration is probably largely due to improvements in permanence of shade which, in many instances, is now said to equal or surpass that of vats and other dyestuffs in performance. This indicated the consideration of the application of this new fungal toxicant as a resin-bonded pigment rather than as a conventional mildewproofing agent. The copper-8-quinolinolate exhibited many of the properties of a pigment—insolubility, impalpability, infinitesimal particle size with color being a function of such size—and accordingly, a dispersion study was initiated.

Pigment dispersion is almost as much of an art as a science and at the present time rests largely upon an empirical basis. As a result of this study, a new concentrate was formulated—Interchem* Milmer Dispersion—containing 30% active ingredient ground in a water-dispersible vehicle incorporating suitable surface-active agents and colloidal polymers for ready miscibility and ease of dilution by water. Concentration of volatile organic solvent is thus

* Registered.

reduced to a minimum as the nonsolids portion of the pad liquor approaches 100% water.

Next to the true dispersion of the insoluble fungicide in the vehicle to be employed, the key to obtaining laundry resistance is the character and condition of the resin binder. Needless to say, it must be completely compatible with the dispersion and not engender any degree of flocculation, agglomeration or flushing before deposition upon the cloth. It should be as concentrated as possible and readily miscible with the bulk of the vehicle—in this case water. Finally, it should exhibit a high degree of resistance to common laundry agents including soap, detergents, soda ash, wet chlorine and even dry cleaning solvents.

For this work, an emulsion was developed containing the resin binders in the internal phase and surface active agents largely in the external phase for ready dilution by water. The internal phase consisted of a mixture of precondensed thermosetting and thermoplastic resins which required the application of heat to achieve their final soap-resistant status. The ratio of thermosetting to thermoplastic resins was carefully adjusted to yield maximum permanence without excessive brittleness or hand. To achieve emulsion stability, a synergistic proportion of anionic and nonionic emulsifying agents was employed.

For maximum degree of fastness, two parts of this emulsion were used to one part of pigment dispersion, which yielded a solids ratio of approximately the same order. In other words, where 1% of active agent was required, it was bonded to the fiber by about 2% resin solids. In a typical formula, five parts of Interchem* Milmer Dispersion plus 10 parts of clear diluted with 85 parts of water yielded a pad liquor containing 1½% copper-8-quinolinolate. At a 67% pick-up, which was average for the laboratory padder, 1% active agent was deposited on the fabric.

After drying, with or without curing, specimens of the treated fabric were subjected to either laundering or dry cleaning. The laundering procedure followed was the No. 4. A.A.T.C.C. Test No. 36-45 for colorfastness of cotton and linen textiles *(3)* in an Atlas Launder-Ometer. Swatches were subjected to either a single laundering or three, five, ten or twenty-five repeated launderings for thorough evaluation. Dry cleaning was performed in accordance with A.A.T.C.C. tentative test method No. 25-45 which was further modified by the substitution of perchlorethylene as being a more active solvent. Swatches were dry cleaned once or subjected to five repeated anhydrous cleanings.

After cleansing, the fabric specimens, along with untreated specimens as controls, were subjected to the A.A.T.C.C. tentative test method No. 30-46—Resistance of Textiles to Mildew and Rot, and Evaluation of Textile Fungicides—described under paragraph 5, Soil Burial Test. The cellulose-destroying activity of the soil bed was such that after seven days of burial, specimens of standard 8 oz. duck retained not more than 10% of their original warp-breaking strength. Residual breaking strength was determined on one-inch strips using the Scott Tester *(14)*.

The soil burial test was selected for several reasons as the sole measure of permanence of antimildew treatment. It is the severest test of textile resistance to microorganism decay, and a treatment that withstands this "graveyard" test will probably withstand any other microbiological attack. As an accelerated test, it is a tremendous time saver. Correlation of laboratory and field results *(15)* indicates that soil burial for one week is equivalent to a full *year's* exposure above ground to microorganism attack. Finally, although the degree of precision is not the highest, it is of the same order as other textile tests and can be duplicated within reasonable limits.

The concentration of copper-8-quinolinolate applied to the fiber is of the utmost significance. It has been stated *(10)* that there is "no significant decrease in tensile strength after 90 days burial, if the copper concentration is 0.60 or 0.70% or higher." Impregnation with greater percentages of copper would conceivably extend the life of the fabric indefinitely. In very few cases would such a high degree of protection be required or desired. Concentrations, for this study, were restricted to three lower ranges of utility. Electrometric analyses of the fabrics after drying indicated that 0.37%, 0.75% and 1.41% protective agent was deposited on the print cloth from three different pad liquor dilutions; while 0.24%, 0.58% and 1.58% effective component was deposited from these same three corresponding pad liquors on the 8 oz. duck.

These specimens of duck and print cloth were simultaneously impregnated with the optimum amount of binder dispersed in the pad liquor. Specimens were cured, laundered once and buried in compost. Data shown in Table I were obtained.

Figs. 1 and 2 illustrate how critical the concentration of active agent is in prolonging the life of fabric when stored under such severe service conditions as soil burial. Heavier cloth, of course, survives longer than light weight cloth, but life is also in direct proportion to copper concentration.

The degree of heat employed to set the resin-bonding agents is also a factor, but evidence indicates that it can be adjusted within limits to suit mill conditions. Maximum curing may be obtained in one to two minutes at 350°F., but almost equivalent effects may be obtained by somewhat longer periods at corresponding lower temperature. In Table II, uncured specimens were dried 5 minutes at 212°F. while the cured were exposed to 350°F. for a minute and a half. The 8 oz. duck was then laundered once and buried in soil for requisite periods of time. These results are depicted in Fig. 3. Note that as the concentration of the copper-8-quinolinolate on the fabric is increased, the significance of curing is markedly diminished.

Laundering is probably the severest single test that a textile encounters in the course of its existence. The combination of chemical factors (alkali, soap and often free chlorine) and physical factors (heat plus mechanical abrasion) has ever imposed a marked limitation upon most agents that might be useful in textile finishing whether it be for decorative or functional purposes. Antimildew treatments that resist laundering have been practically unknown. It has now been found that by resin-bonding an insoluble fungicide to the textile, a large proportion of mildew resistance may be retained after repeated launderings. Degree of retention, after various numbers up to twenty-five A.A.T.C.C. No. 4 launderings for 8 oz. duck impregnated with 0.58% and 1.58% copper-8-quinolinolate and as evidenced by the soil burial test, is shown in Table III.

Graphical illustration of these data is appended (Figs. 4 to 9) including the protection afforded by a lower concentration of copper-8-quinolinolate (0.24%) on this same material and the change in protective

TABLE I
Concentration of Protective Agent

		TENSILE STRENGTH (POUNDS)			
I. 8 Oz. Duck	*Initial*	*1 week*	*2 weeks*	*3 weeks*	
Untreated	99±3	8±2	Disintegrated		
Resin only	101±6	27±3	Disintegrated		
0.24% copper 8	85±7	86±4	40±2	Disintegrated	
0.58% copper 8	88±5	102±4	62±6	19±1	
1.58% copper 8	92±1	96±4	85±4	43±5	
II. Print Cloth	*Initial*	*1 week*	*2 weeks*	*3 weeks*	
Untreated	50±1	Disintegrated			
0.37% copper 8	43±2	35±7	2±1	Disintegrated	
0.75% copper 8	42±1	37±6	14±1	Disintegrated	
1.41% copper 8	43±2	47±1	23±2	12±4	

* Registered.

Tensile Strength Retention
8 Oz. Duck Impregnated with Resin-Bonded Copper-8-Quinolinolate at Indicated Concentrations

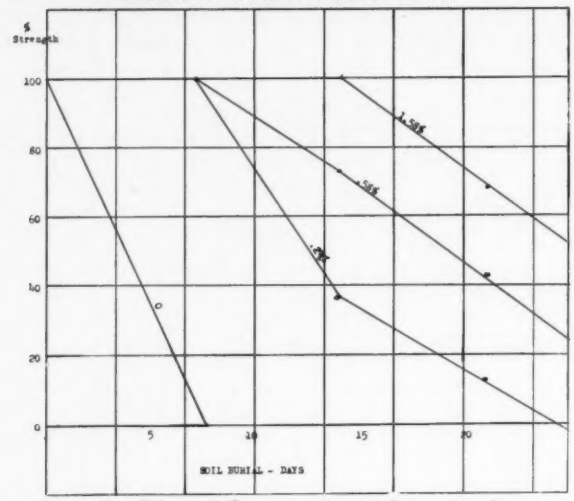


Figure 1—Effect of Concentration of Protective Agent

Tensile Strength Retention
4 Oz. 80 Square Print Cloth Impregnated with Resin-Bonded Copper-8-Quinolinolate at Indicated Concentration

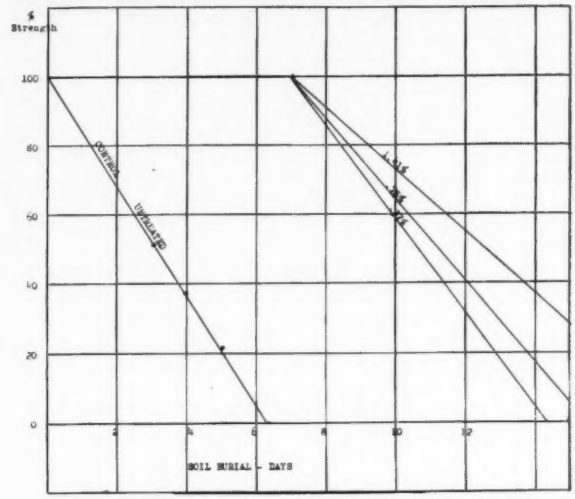


Figure 2—Effect of Concentration of Active Agent

TABLE II
Effect of Curing

	TENSILE STRENGTH (POUNDS)			
	Initial	*1 week*	*2 weeks*	*3 weeks*
0.24% copper-8 uncured	96±2	99±6	13±3	Disintegrated
0.24% copper-8 cured	85±7	86±4	40±2	Disintegrated
0.58% copper-8 uncured	89±4	111±2	54±7	9±3
0.58% copper-8 cured	88±5	102±4	62±6	19±1
1.58% copper-8 uncured	97±2	117±6	84±9	43±5
1.58% copper-8 cured	92±1	96±3	85±4	46±1

action when these same three concentrations are applied to a lighter construction fabric such as 80 square cotton print cloth. No explanation has been discovered for the increase in tensile strength which occurred after one week's soil burial, to the extent of from 15% to as high as 35% greater strength than that of another section of the same fabric which had not been buried. This phenomenon was noted in every instance in which no deterioration occurred after one week's burial and may possibly be due to a change in ratio of amorphous to crystalline cellulose in the fiber.

Tensile Strength Retention
8 Oz. Duck Impregnated with Resin-Bonded Copper-8-Quinolinolate at Indicated Concentration and Subjected to One No. 4 A.A.T.C.C. Laundering

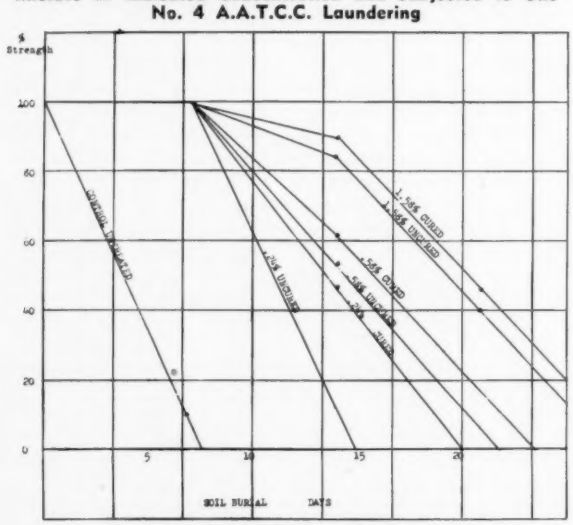


Figure 3—Effect of Curing

The initial laundering removed much of the surface coloring from the specimen of cloth, leaving it a light tan shade, but apparently the loss of protectiveness was not highly significant. Progressive decrease in color after the first laundering was of a rather low order. In view of the somewhat unattractive natural hue of the copper-8-quinolinolate and to demonstrate the feasibility of simultaneous dyeing and mildewproofing, resin-bonded pigments were applied to cloth from the same bath and by the same operation. Shades of blue, yellow, green, red and brown are readily obtainable when compatible aqueous dispersions of the corresponding pigments are incorporated in the liquor containing the antirot agent and resin-bonding emulsion. The purity of shade was somewhat modified by the mustard hue of the fungus-proofing agent, but almost any shade congruent with the chroma and hue of this agent may thus be obtained on textiles.

Traditionally, resin-bonded pigments when applied to textiles, have exhibited weaknesses to cycles of alternate exposure to ultraviolet light and laundering. Developments over the last few years have largely overcome this initial weakness and confirmation was observed during this study. Portions of cloth containing 1% copper-8-quinolinolate were subjected to 1, 2 and 3 cycles of alternate exposure to forty hours light in the Fade-Ometer followed by a No. 4 wash. The exposed and unexposed sections of each piece of cloth were then chemically analyzed for copper. Figure 10 indicates that the exposed section of cloth retained somewhat more copper after the first cycle and somewhat less after the second and third cycles, but

Tensile Strength Retention
8 Oz. Duck Impregnated with Resin-Bonded Copper-8-Quinolinolate (1.58%)

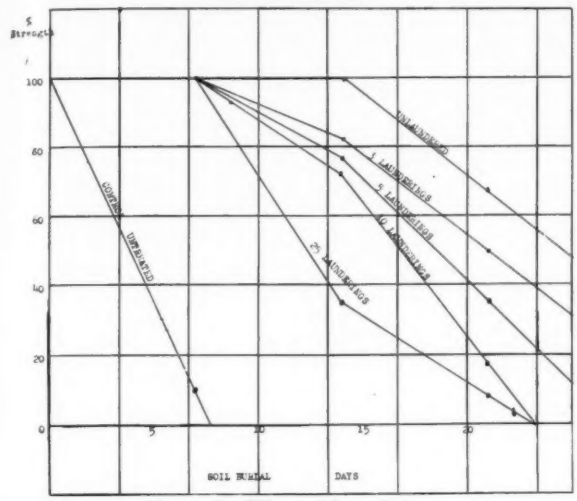


Figure 4—Effect of Laundering

Tensile Strength Retention
8 Oz. Duck Impregnated with Resin-Bonded Copper-8-Quinolinolate (0.58%)

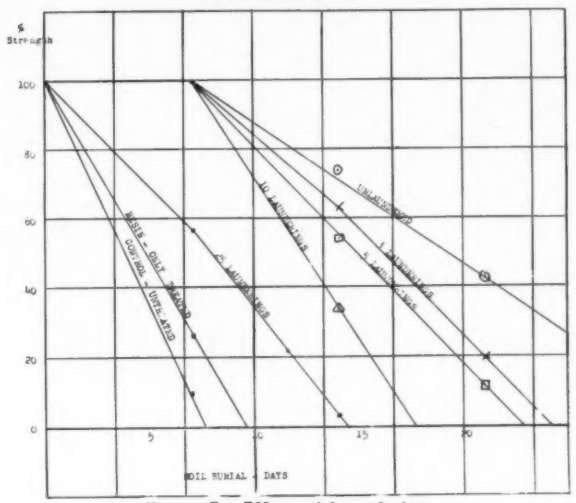


Figure 5—Effect of Laundering

the absolute differences between the two would have very little effect upon the mildew resistance of the cloth.

Persistence of the antimildew agent after dry cleaning was also quite high inasmuch as both the agent and resins used for bonding have a low degree of solubility in conventional cleaning solvents. Data for resistance of 8 oz. duck impregnated with 0.58% and 1.58% resin-bonded copper-8-quinolinolate to mildew deterioration after one and five repeated dry cleanings with perchlorethylene are shown in Table IV. These results are graphically exhibited in Figs. 11 and 12. Protection achieved on a lighter construction fabric, such as 4 oz. print cloth, is depicted in Fig. 13.

TABLE III
Effect of Laundering

	TENSILE STRENGTH (POUNDS)			
0.58% Active Agent	*Initial*	*1 week*	*2 weeks*	*3 weeks*
Unlaundered	97±6	110±5	74±2	43±5
1 laundering	88±5	102±4	66±6	19±1
3 launderings	91±9	120±3	62±4	18±2
5 launderings	91±5	107±4	60±6	12±4
10 launderings	92±10	110±3	32±7	Disintegrated
25 launderings	86±7	49±9	3±1	Disintegrated
1.58% Active Agent	*Initial*	*1 week*	*2 weeks*	*3 weeks*
Unlaundered	102±1	120±4	104±9	68±6
1 laundering	92±1	96±3	85±4	50±4
3 launderings	85±1	113±4	83±8	46±1
5 launderings	96±5	126±2	77±7	36±3
10 launderings	96±4	110±6	73±5	28±3
25 launderings	83±5	106±3	34±6	19±5

Tensile Strength Retention
8 Oz. Duck Impregnated with Resin-Bonded Copper-8-Quinolinolate (0.24%)

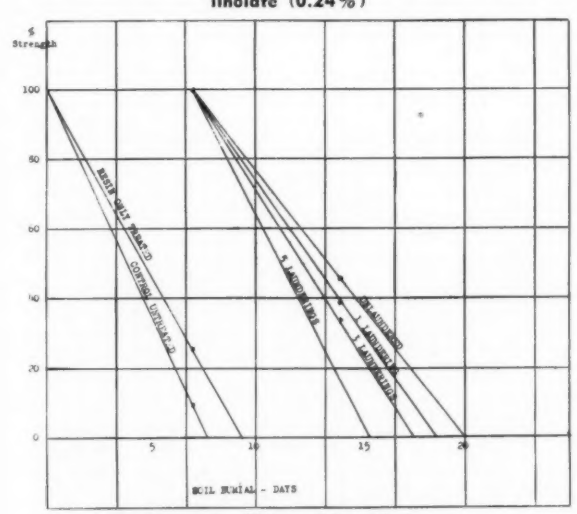


Figure 6—Effect of Laundering

Tensile Strength Retention
4 Oz. 80 Square Print Cloth Impregnated with Resin-Bonded Copper-8-Quinolinolate (0.37%)

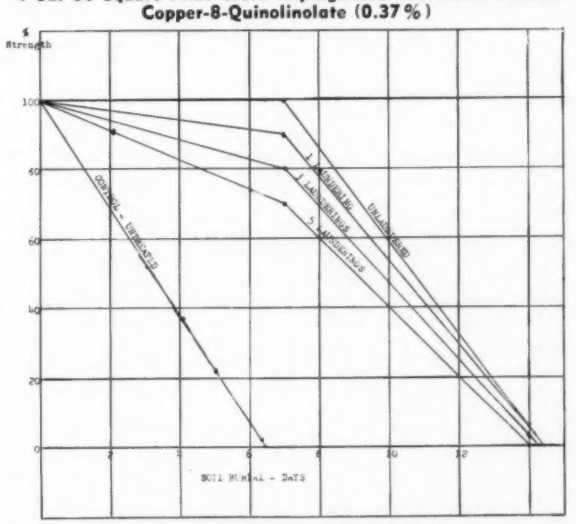


Figure 7—Laundering Lightweight Cloth

Tensile Strength Retention
4 Oz. 80 Square Print Cotton Impregnated with Resin-Bonded Copper-8-Quinolinolate (0.75%)

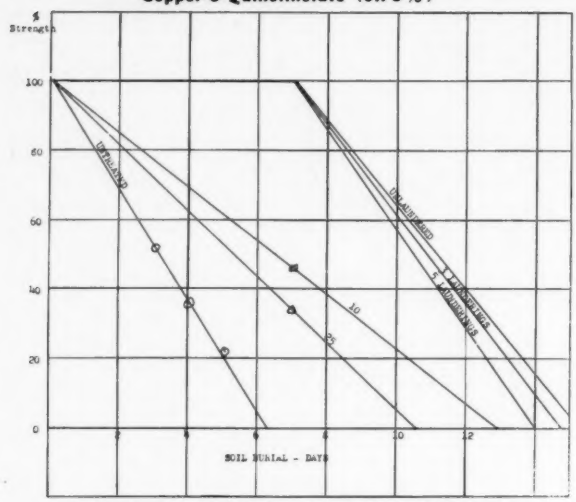


Figure 8—Laundering Lightweight Cloth

Tensile Strength Retention
4 Oz. 80 Square Cotton Print Cloth Impregnated with Resin-Bonded Copper-8-Quinolinolate (1.41%)

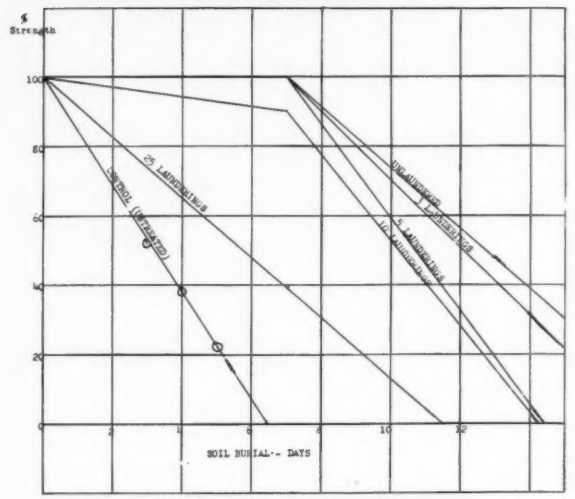


Figure 9—Laundering Lightweight Cloth

Active Agent Retention
80 Square Print Cloth Impregnated with Resin-Bonded Copper-8-Quinolinolate (1%) and Microanalyzed after Light and Wash

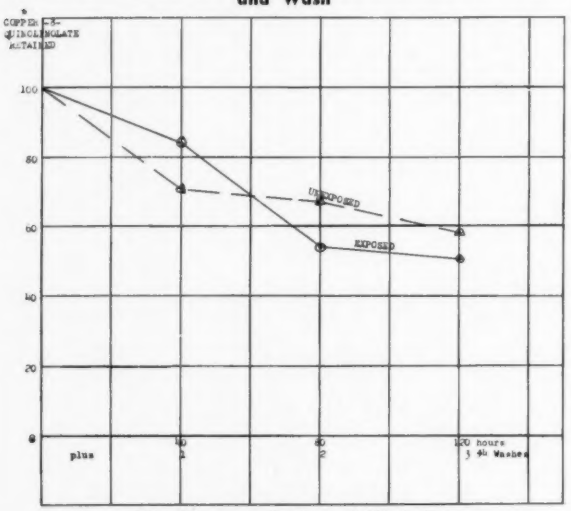


Figure 10—Alternate Light and Wash Exposure

Tensile Strength Retention
8 Oz. Duck Impregnated with Resin-Bonded Copper-8-Quinolinolate (0.58%)

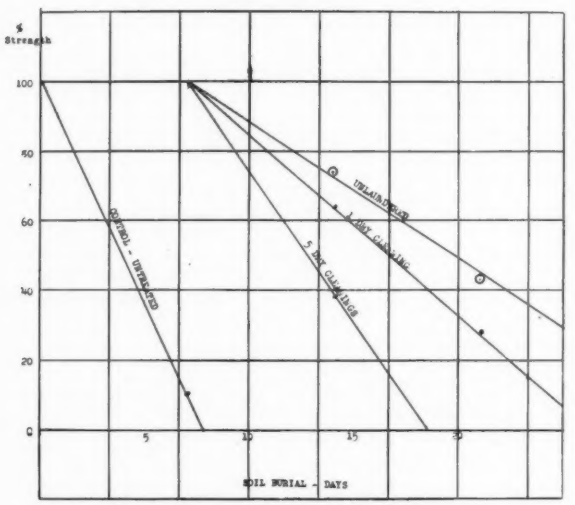


Figure 11—Effect of Dry Cleaning

Most of the work covered by this study centered around the protection of cellulosic cotton from mildew and rot. However, it was also discovered that copper-8-quinolinolate is effective for other categories of fibers. Jute burlap bagging, which is often subjected to an environment conducive to fungi growth, was impregnated with 1% resin-bonded copper compound and assayed for resistance to microorganisms by soil burial. Fig. 14 indicates the prolongation of life obtained by protecting bagging both of jute and Osnaburg cotton with 1% copper-8-quinolinolate. Since burlap is almost synonymous with drab, unattractive textiles, synchronous dyeing with resin-bonded pigments was also accomplished. Attractive shades of green, yellow, orange, grey and red were obtained when burlap was padded with a liquor containing pigment dispersions as well as the mildewproofing agent. Appearance of these dyeings suggested their suitability for drapery in the modern style.

Animal fibers such as wool, under conditions of high humidity, are fertile soils for both fungi and bacteria development. Industrial wool felt in humid service, such as felt used as a support in the manufacture of paper, deteriorates rapidly as

TABLE IV
Effect of Dry Cleaning

		TENSILE STRENGTH (POUNDS)		
0.58% Agent	*Initial*	*1 week*	*2 weeks*	*3 weeks*
1 dry cleaning	107±7	125±10	65±7	16±6
5 dry cleanings	115±7	129± 4	39±7	Disintegrated
1.58% Agent		*1 week*	*2 weeks*	*3 weeks*
1 dry cleaning	116±6	130±2	58±10	28±3
5 dry cleanings	119±9	121±3	55±11	23±4

Tensile Strength Retention
8 Oz. Duck Impregnated with Resin-Bonded Copper-8-Quinolinolate (1.58%)

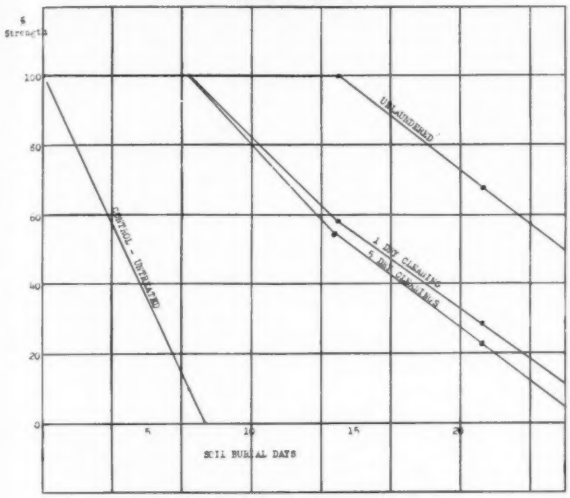


Figure 12—Effect of Dry Cleaning

Tensile Strength Retention
8 Oz. Duck Impregnated with Resin-Bonded Copper-8-Quinolinolate (1.41%)

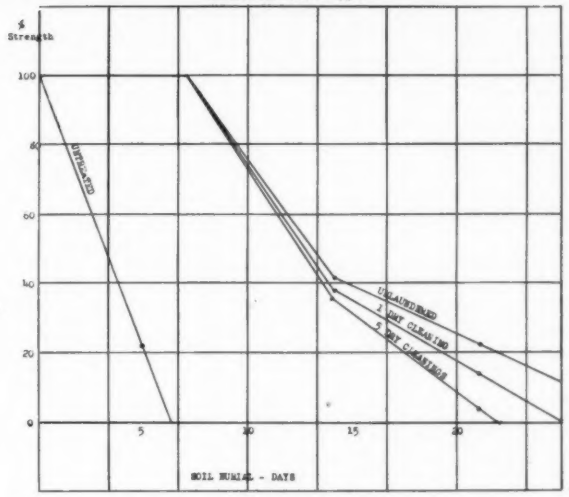


Figure 13—Effect of Dry Cleaning

Tensile Strength Retention
Bagging Impregnated with Resin-Bonded Copper-8-Quinolinolate (1%)

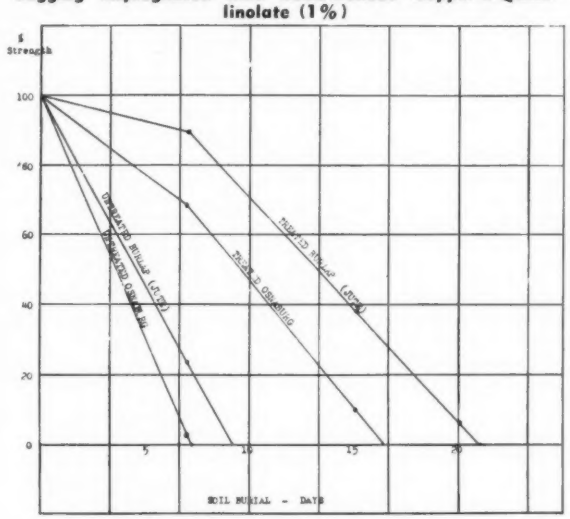


Figure 14—Protection of Bagging

Tensile Strength Retention
Papermaker's Felt Impregnated with Resin-Bonded Copper-8-Quinolinolate (1%)

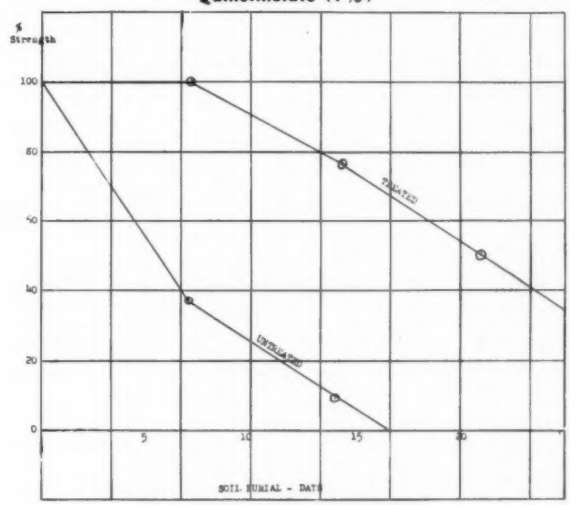


Figure 15—Protection of Wool

a result of microorganism growth. Figure 15 indicates the enhancement of service obtained when paper-maker's felt is fortified by resin-bonded 1% copper-8-quinolinolate.

For service on fiber constructions where laundry fastness is not involved such as industrial wool, jute and tentage canvas, a simpler resin-bonding agent has been developed. This consists of an aqueous dispersion of a completely polymerized copolymer resin which can be applied from an aqueous bath and, upon air drying, deposits a water resistant film. This film exhibits good permanence when subjected to water leaching and soil burial as well as weathering. Because of its ease of application and hydrophobicity, this combination is suitable for many textile uses at high humidity, but where soap is not encountered. Thus, tobacco cloth, awning and umbrella fabrics, convertible tops, fire hose, sails, shoe linings, webbing, tapes and countless other types of textile materials which are exposed to the ravages of microbiological deterioration could have their service life appreciably prolonged by this relatively simple and inexpensive finishing treatment. Among other potential applications, mention may be made of baggage lining, netting, cordage, tarpaulins, filter cloth, tapes, coated fabrics, cotton shades and cover cloths, outdoor furniture, oil cloth, canopies, brattice cloth and sanitary textiles. Many textile uses, formerly precluded because of rot or mildew, may now be re-examined in the light of the availability of these new resin binders for mildewproofing agents.

Summary and Conclusions

A method is presented for increasing the permanence of antimildew and antirot properties of textiles. A water-insoluble fungicide, such as copper-8-quinolinolate, is affixed to the textile fiber by resin-bonding. Gradual loss of protective agent occurs upon repeated laundering, but
(Concluded on Page 156)

MERITS OF THE METALLIZED DYESTUFFS*

H. LUTTRINGHAUS
General Dyestuff Corporation

Theoretical Considerations

THE metallized dyestuffs are well known to you under various names, such as Palatine Fast, Neolan, Chromacyl, Calcofast wool dyes and others. The majority of these dyes are chromium coordination complexes of azo dyes of the ortho-dihydroxy type *(1)* as shown in Fig. 1.

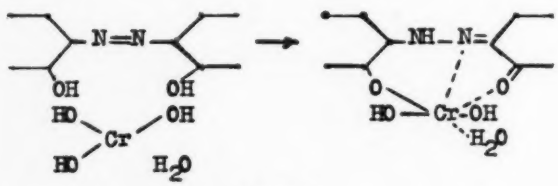


Figure 1

These chrome complex dyes show such a peculiar behavior in contrast to the ordinary acid wool dyes that it seems worth while to discuss the researches of several investigators and draw conclusions from the results of their work.

The first part of this paper might seem to many of you very complicated. But it will take only a few minutes to make these necessary theoretical explanations.

The fundamental difference between the application of acid dyes and the application of metallized dyes is the high amount of sulfuric acid necessary for the latter. When wool dyed with a metallized type is boiled with white wool and increasing amounts of sulfuric acid, we can observe that more dyestuff is transferred to the white wool with the higher amounts of acid. Therefore, increasing amounts of acid increase the leveling of metallized dyes. When we prepare the azo dyestuff, from which the corresponding metallized type has been derived, we find that the chrome-free dye behaves like a regular acid dyestuff. The transfer of the original azo dyestuff is not increased with increasing amounts of sulfuric acid *(2)*.

The introduction of chromium into the molecule of the dyestuff changes, therefore, its dyeing properties to a great extent. Since not only the dyeing properties are changed, but also the fastness properties are increased, we have to assume that the chromium in the complex plays a part in the fixation of the dyestuff on the wool.

Valko *(3)* assumes that the chromium atom which is contained in the complex has the ability to form a co-ordinative linkage with certain groups of the keratin molecule. The diagram in Fig. 2 illustrates this.

An increasing amount of acid increases the ionization of the amino group and decreases the ionization of the carboxyl group of the keratin. The possibility of complex formation of heavy metals is, therefore, diminished.

According to this theory the affinity of the Palatine Fast Dyestuffs is not only due to the electrostatic linkage between the amino group of the keratin molecule and sulfonic group of the dyestuff, but is also dependent upon the forces acting between the wool fiber and the chrome complex. But with ordinary acid dyes, the salt formation is intensified on adding acid, whereas with the metallized dyes the co-ordinative linkage is weakened. Evidently this co-ordinative linkage of the complex chromium has more bearing on their affinity for the fiber than the salt formation, because the affinity as a whole decreases with higher amounts of acid. Detailed research work of Ender and Müller *(4)* has confirmed Valko's assumption.

Fiber

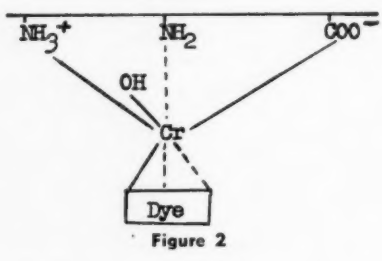


Figure 2

Similar to Valko's views, these investigators state that wool forms two different linkages with chromiferous dyestuffs:

1. A salt linkage between the free dye-acid and the wool.
2. A co-ordinate linkage between dyestuff complex and basic groups of the wool.

The hydrolysis of the salt linkage will decrease with increasing hydrogen-ion concentration; that means the fixation of the dyestuff is increased.

But a complex formation, dye—wool, is only possible with undissociated groups of the wool. Therefore, this linkage is diminished with increasing hydrogen-ion concentration because the ionization of the basic groups in the wool is increased correspondingly.

The two reactions are, therefore, running in opposite directions.

But the retardation of the complex formation seems to be predominant as the final degree of affinity of the chromiferous dyes is lowered by the addition of more acid.

This is the reason that higher amounts of sulfuric acid slow down the exhaustion of Palatines. Ender and Müller found that complex chromium derivatives of dyes are amphoteric compounds. The chromium in the complex is positively charged and can, therefore, form an inner salt with the sulfonic group (zwitterion).

Based on this theory, the authors explain differences between mono- and disulfonated Palatines. It is claimed that the disulfonated products resemble the regular acid dyes more than the monosulfonated types.

While certain differences of exhaustion exist we do not think that the two groups can be placed into two distinct classes. We are listing here first several monosulfonated types.

Palatine Fast Yellow ELNA.
Palatine Fast Yellow GRNA.
Palatine Fast Orange GNA.
Palatine Fast Orange GENA.
Palatine Fast Orange RNA.

* Presented at meeting, Ontario Section, Canadian Association of Textile Colourists and Chemists, November 4, 1949 and published in Canadian Textile Journal, November 25, 1949.

Palatine Fast Pink BS.
Palatine Fast Red RNA.
Palatine Fast Violet 3RNA.
Palatine Fast Blue BNOA.
Palatine Fast Black WANA.

The following are disulfonated:

Palatine Fast Pink BNA High Conc.
Palatine Fast Claret BNA.
Palatine Fast Violet 5RNA.
Palatine Fast Blue 5RNA.
Palatine Fast Blue GGNA.

Red RNA and Pink RS are both monosulfonated, but the speed of exhaustion of Red RNA is distinctly higher. Yellow ELNA and Yellow GRNA are also both monosulfonated, and the speed of exhaustion of Yellow GRNA is distinctly higher. These exhausts do not substantiate the theory of the inner salt. Therefore, one cannot draw a line between the two types separating them into two distinct groups.

And from practical experience we know that no difficulties are encountered when the two groups are used together.

Practical Considerations

Whether we accept Ender and Müller's and Valko's view, or whether we prefer to follow Goodall's theory *(5)* of swelling of the fiber at a low pH, we must draw the same conclusions: A high amount of sulfuric acid is necessary to obtain level dyeing, and the higher the concentration of the acid the better the distribution of the dyestuff. The acid is, so to say, a leveling agent for the metallized dye. That puts this group of dyes into a class by themselves. It is true that they exhaust well with 2 or 3% sulfuric acid, but the dyeings appear skittery and weaker than dyeings carried out with 8% sulfuric acid. Millson and Mooradian *(6)* have made measurements of dyed materials and have shown that dyeings with 8% sulfuric acid are 20% to 40% stronger than dyeings with 4% sulfuric acid. This statement is correct in many cases. However, the dyeing with the lower amount of acid does not always need to be weaker. On hard twisted gabardines the lower amount of acid sometimes appears to produce a heavier shade which is due to poor penetration. It can also be seen that with 8% sulfuric acid more dyestuff remains in the bath than with 2% to 4%. Therefore, 8% sulfuric acid is usually recommended for the dyeing of Palatines. This statement, however, is not sufficient. 8% sulfuric acid on the weight of the wool assures a high enough concentration at a liquor ratio 1:30 or 1:40; but when the liquor ratio is increased to 1:60, or even higher, as it is sometimes encountered when a sample piece is dyed in a 4 piece kettle, it cannot be expected that the same results are obtained. The dyeing might be skittery and not sufficiently penetrated and the shade obtained cannot be duplicated later on. In such extraordinary cases the amount of sulfuric acid has to be increased to maintain the necessary concentration which would produce approximately a pH of 2. It is logical that at a short liquor ratio the dyer can reduce the amount of acid, so that at a liquor ratio 1:15 6% sulfuric acid is not out of line, and has produced satisfactory results.

For the production of blacks, different dyeing methods are recommended, which produce satisfactory results. The dyeing is usually started with 2 to 3% formic acid and after boiling for 20 minutes 3% more formic acid is added. Exhaustion is completed with a further addition of 2% of sulfuric acid.

Another method, in general practice today, is the use of 4% sulfuric acid from the start. For blacks, leveling agents are not necessary and should not be used.

Since the higher amount of sulfuric acid retards the dyestuff in the case of the Palatines, it is superfluous to add Glauber's salt to the dyebath. Such an addition is without point, since a retarding action of Glauber's salt is out of question in the presence of high amounts of sulfuric acid.

The dyeing of metallized dyes is frequently started with 2 to 3% of sulfuric acid, the remaining acid being added later on. Considering that the high amount of acid is added to obtain a level dyeing, it seems to be better to add all the acid at the beginning of the dyeing process, just as you certainly would prefer to add a leveling agent to the bath at the beginning of the dyeing process and not later on. It might be advantageous to add the acid in portions in special cases, but generally speaking we must say that according to our experience better results are obtained with all the acid in the bath at the beginning. A later addition of acid might no longer produce a good leveling and might result in a failure, especially if the material is not boiled long enough. A perfect dyeing is obtained after 1½ hours boiling time. Matching to shade should not be started before the dyeing has boiled for at least ¾ to 1 hour. A good boil is the prerequisite for level pieces and penetrated yarns.

A deterioration of the fiber by chromic acid, as it occurs during the development of chrome colors, is not possible with Palatines. Therefore, Palatine dyed wool often shows a better tensile strength than chrome dyed wool, particularly in heavier shades. However, the wool can absorb considerable quantities of sulfuric acid and, if the material is not rinsed well, a fiber damage can occur during a sharp drying or decating. Other acids, like formic, sulfamic or phosphoric do not produce level dyeings. In addition, phosphoric acid should not be used for other reasons as will be explained later on. To avoid prolonged rinsing or neutralization of the sulfuric acid, the dyer welcomes the possibility of reducing the amount of acid. This can be accomplished by specific leveling agents. Leveling agents recommended for Palatines are neutral and do not split off acid as is often assumed.

We distinguish between leveling agents possessing affinity for the fiber and those with affinity for the dyestuff.

To the first group belongs the alkyl aryl sulfonate, Palatine Fast Salt N Conc. Powder; to the second, the nonionic ethylene oxide condensation product, Palatine Fast Salt O Solution. The effect of a leveling agent with fiber affinity, like Palatine Fast Salt N Conc. Powder, can be explained as follows: A contest takes place between the leveling agent and the dyestuff, whereby the former goes on the fiber first and then makes way for the dyestuff to follow. Thereby, a temporary reduction of affinity and, thus, an increase in leveling is caused. This is a displacement reaction by which the leveling agent is being continually regenerated.

As far as the effect of a leveling agent with dyestuff affinity is concerned, the end-result is similar to that of a leveling agent with fiber affinity. Here, however, fiber and leveling agent compete for the dye. Valko *(5)* has shown that several dyestuff molecules are loosely bound to the Palatine Fast Salt O Solution, perhaps by secondary valencies to the oxygen atoms which are present in a large number. Palatine Fast Salt O Solution, by combining with the dye molecules, will produce a larger particle size. Thus, a considerable reduction in the speed of diffusion is obtained. The molecules of dye are liberated gradually and can then go on the fiber. Palatine Fast Salt O Solution retards, therefore, the exhaust of the dye without reacting with the wool itself.

The effect of nonionic products like Palatine Fast Salt O Solution can be eliminated by an addition of an anionic product like Palatine Fast Salt N Conc. Powder. The reaction between the two may cause the main portion of these agents to be eliminated, so that no sufficient quantity of either is left to influence the level dyeing. Therefore, Palatine Fast Salt O Solution and N Conc. Powder should never be used in the same dyebath.

A leveling agent is advisable in order to protect the material and the machinery because a considerably smaller amount

of acid can be used. With 3% Palatine Fast Salt O Solution or 2% Palatine Fast Salt N Conc. Powder only 4-5% sulfuric acid is necessary. We recommend Palatine Fast Salt N Conc. Powder for piece goods which are difficult to penetrate. The powder brand is superior to the O Solution as far as penetration of hard-twisted material is concerned, but Palatine Fast Salt O Solution is much better in the case of mixed or tippy-dyeing wool.

During the various wet treatments before dyeing, water softeners might have been used. It is of importance that they be thoroughly removed from the wool as they can interfere with the shade and fastness properties of metallized dyestuffs, regardless of whether they are inorganic phosphor salts or organic compounds. They all are capable of attacking the chromium complex of the dyestuff. That explains also why, with phosphoric acid, different shades are obtained than with sulfuric acid. The danger of phosphate salts cannot be underestimated. To illustrate the sequestering power of water softeners, a dyeing of Palatine Fast Green BLNA, which is especially easily attacked, was carried out once with and once without an addition of Nullapon B. It can be seen that the dyeing with Nullapon B produced a reddish violet. The original azo dyestuff from which Green BLNA was derived is a red and by removing part of the chromium out of the complex we approached this original shade. At the same time we have destroyed the fastness properties which can be easily demonstrated when comparative wash tests of the green and violet dyeing are made. The other types do not show as much change in shade, Yellow ELNA, for instance, turns greener tand brighter, and Blue GGNA redder; but the fastness properties are affected nevertheless. Furthermore, if the water softener is unevenly distributed on the piece, unlevel dyeings may result.

That the chromium, even in the completed dyeing, is capable of further action can be shown when a dyeing of Palatine Fast Yellow GRNA is topped with Chromoxane Pure Blue BA *(2)*. This chrome dyestuff produces a dull red before chroming, but when we dyed it on a Palatine Fast Yellow GRNA bottom, we did not obtain the expected orange, but a green. When Palatine Fast Yellow GRNA was topped with an acid color like Supranol Bordeaux BRRN which does not react with chromium, the expected combination of the two shades was obtained.

Properties

Since the Palatine Fast dyestuffs contain chromium, they produce fastness properties which approach those of chrome dyeings. The application, however, is as simple as with ordinary acid dyestuffs. It is, therefore, natural that they appeal most of all to the piece dyer. The levelness of shade is generally superior to the same shade produced by the usual top, and especially monochrome, dyeing. The advantages over the top-chrome dyeing method are manifold. The dyer can see and observe the shade of the dyeing constantly and does not need to wait for the shading until chroming is practically completed. They have, therefore, a distinct advantage over the top-chrome method since a lot of time and effort can be saved.

With Palatines a much better penetration is obtained than with chromate dyeing methods. Especially on tropical worsteds and on gabardines the results are much better, as the solidity of shade is excellent.

The possibility of heat wrinkles is greatly reduced and good levelness on mixed wools is produced. The sensitivity for metals like iron or copper, which is so often detrimental in chrome dyeing, especially by the top-chrome method, is practically nonexistent with Palatine Fast dyes.

There is another outstanding feature of the Palatines. They can be applied to carbonized and unneutralized piece goods. Carbonizing spots become a thing of the past when a mill switches over to Palatine Fast dyestuffs. In the case of Palatine Fast dyes, carbonized wool can be dyed without any addition of acid. We suggest to wet out the material lukewarm with 2% Palatine Fast Salt N Conc. Powder and to run the machine for about 20 to 30 minutes so that an even distribution of the acid takes place. Then the dyestuff is added to this bath without dropping the liquor. If it should be necessary to wet out the material at a higher temperature, it is advisable to rinse off most of the excess acid with water at room temperature. In this case it would, of course, be necessary to compensate for the lost acid.

The fastness to light of Palatines for men's wear shades is as good as that produced with the average chrome colors. The fastness to alkaline perspiration of some metallized dyes is not so good as one can obtain with chrome dyes, but the fastness to perspiration is entirely sufficient and has led to very few complaints. The reason for this is probably that the average man in meat-eating countries perspires acid and not alkaline.

Effect threads of acetate, rayon or cotton are left sufficiently white. However, with the presence of such effects, a neutralization after dyeing is advisable.

Among other materials successfully dyed over the reel are worsted Jerseys. These goods are usually kept in stock as grey goods, because of the quick changing demands for different shades. Another good feature of the Palatines enters here into the picture. They are suitable for discharge printing. Such discharge prints are not only made on Jerseys, but also on chlorinated chalis for neckties. How could a full range of dischargeable shades with good fastness properties be dyed if there were no Palatine Fast dyes? There are no other level dyeing dischargeable blues with any fastness properties to speak of than Palatine Fast Blue GGNA, RRNA and BNOA.

The yarn dyer is also making use of the rare and valuable properties of these dyes. They are applied on packages and, to a large extent, on skeins in machines of the Klauder-Weldon and Hussong types. Since they are fast to sea water, they can be used for bathing suits (at least up to medium shades, to be conservative).

High-class carpet yarns are dyed with Palatine Fast dyestuffs, not only because of their fastness to light, saltwater spotting, fastness to shampooing and fastness to alkali, but also because they stand an oriental finish.

Chlorinated yarn and piece goods are dyed level with Palatines. However, with certain chlorination processes it seems to be preferable to chlorinate after dyeing. The changes which occur with Palatine Fast dyeings during chlorination depend largely on the chlorination process itself. While these changes might be appreciable in pastel shades, little difference is observed in medium and dark shades. The fastness to washing of the Palatines is as good on chlorinated as on normal yarn. While we cannot expect an unlimited fastness to washing, we have a vast improvement over acid colors. Thus, the dyer can meet demands for increased wash fastness without any sacrifice of levelness.

The Palatines give excellent results on slubbing, particularly in weaker shades. It has been observed that yarn from Palatine-dyed slubbing showed a distinctly better tensile strength than yarn made from chrome-dyed slubbing.

The use of Palatines for raw stock is very limited as the fastness to fulling is not sufficient in most cases. However, if the material undergoes only a light fulling in neutral solution they can be used. Since they show a tendency for tippy dyeing we suggest the use of Palatine Fast Salt O Solution or Peregal TW to correct this condition.

Palatine Fast dyestuffs are, generally speaking, faster on nylon than on wool. Many of them dye approximately the

(Concluded on Page 156)

PRINTED SILK FABRICS

F. F. JACOBS

Technical Director, The Aspinook Corporation

A FEW months back a report appeared in one of the newspapers that importations of printed silk fabrics from Europe showed colors of excellent fastness properties, faster than domestically printed goods. These reports did not appear to be reasonable as dyestuffs available in Europe are certainly also available in this country.

The general rule in printing silks is to use rather vivid coloration and with this tendency to start, the use of colors with fastness properties similar to the ones used in printed cottons and spun rayons was precluded. However, in order to make sure on this point, a variety of printed swatches were obtained from Belgium and France and analyzed as to the fastness of the dyestuffs used. Naturally the fastness tests included, besides water and wash tests, fastness to dry cleaning as well as perspiration. These tests definitely proved that the colors used are similar to the dyestuffs employed in this country and also disclosed the fact that some patterns showed dyestuffs with only a good fastness to perspiration, others with good fastness only to washing, and still others only fast to dry cleaning.

Complaints collected by retailers and department stores from the buying public definitely indicated that the fastness properties did not come up to the public's expectation.

During the war years, silk prints, and all silk fabrics for that matter, were practically nonexistent and the buying, therefore, reverted to substitutes such as spun rayons and cottons which as a rule are processed with fast colors. Even though the fastness of prints on cotton and spun rayon is very good, the trade has further educated the buying public by stating on the material certain fastness properties. For instance, on lighter cottons, the notation invariably appears that the goods are washable. On heavier cottons used for drapery and upholstery purposes, the notation states that the printed material is "tub and light fast." No such thing was ever done in the silk converting industry. It is no wonder, therefore, that the general public is not aware of the limitations.

During one of the textile meetings, the question was raised by a lady present, whether the present day dyes are better than they were a few years ago. She stated that she had tried to wash a piece of silk and was amazed how much color came off and how badly the unprinted areas were stained. Such remarks are a distinct indication that the purchaser of printed silk does not know for what specific uses the goods have been produced.

There are several methods of approaching the problem. One would be to mark the end use of the printed silk. This is very essential as the fastness properties and requirements differ to a considerable degree. From handkerchiefs and scarfs, fastness to washing is essential. These items are generally washed at home in perhaps slightly more than lukewarm water and soap, then rinsed and hung up to dry. The material, therefore, should show no bleeding of the colors during the soaping operation, and also no bleeding or staining of the unprinted areas during drying.

Printed silks for sportswear have another requirement. Insofar as they are fabricated as shirts, shorts, and bathing suits, the requirements for such items are fastness to water and light exposure. The prints should not mark off when kept in a wet state with salt water or fresh water and also should show no fading on reasonably long exposure to sunlight.

Printed silks intended for dress goods have a fastness requirement of their own. First, the fastness to perspiration, whether alkaline or acid, should be perfect, and secondly, the fastness to dry cleaning is very important as silk dresses are generally cleaned by various dry cleaning fluids and are not washed.

By selecting colors with proper fastness properties for each intended use, many of the complaints could be eliminated.

TABLE I
Color Types Suitable for All-Round Purposes

Color	*Number*	*Type Name*
Yellow	Prototype 187	Sulphon Yellow R
	Prototype 139	Milling Yellow O
	Prototype 138	Milling Yellow H5G
Orange	Prototype 276	Fastusol Orange LGGL
	Prototype 152	Polar Orange R
Red	Colour Index 430	Polar Red
Blue	Prototype 40	Brilliant Wool Blue FFR
	Prototype 222	Brilliant Indocyanine 6B-CF
	Colour Index 833	Wool Fast Blue
Green	Colour Index 583	Chlorazol Dark Green
Brown		Supranol Brown 5RN Extra (Also mixtures based upon above selection)
Grey	Prototype 206	Alizarine Fast Gray BBLW
Black	Prototype 202	Zambesi Black V.

Analyzing the situation further, it appears that to some extent the trouble starts with the designing studios. The artists drawing up the designs have no idea as to the fastness limitations of certain shades and, therefore, use any shade which they may deem necessary for the production of certain styling effects.

This point was ascertained by purchases made in a variety of stores retailing silk prints. The price range per yard of printed silk obtained was anywhere between $1.50 and $6.00, and tests of such samples indicated that the fastness properties were more or less identical. The quality also appeared to be very similar. Obviously, the difference in price represented either outstanding designing or the "name" and location of the store.

It may not be practical in silk printing to mark the cloth as to its intended end use, primarily due to the fact that the designing and the cloth itself is generally adaptable for many purposes.

In silk printing, therefore, a better approach would be to select proper dyestuffs, which would answer all purposes and fastness requirements. This would necessarily limit the designing studios to some extent, as far as brightness is concerned, although a fairly complete range of shades could be obtained.

A considerable number of products have been tested for all required fastness properties. As a result, the types* shown in Table I were selected as suitable for all-round purposes.

Products within each shade group are chemically similar but their working properties may show variations. A dyestuff of one manufacturer may be less soluble than a similar product from another source. They also may show a difference in their sensitivity to electrolytes or to certain thickenings. The final selection, therefore, would have to be made from this point of view.

The selected types show the following properties:

Dry Cleaning (Varnoline)—Excellent.

Perspiration (Acid and Alkaline)—Excellent.

Washing (A.A.T.C.C. Domestic Wash Test)—Good to Very Good.

Water (Salt and Fresh)—Good.

Light (5 to 80 hrs.)—No Fading.

(Only the blue and violet types lower the light fastness rating to 5 hours.)

In view of the fact that the selection has been made primarily from the point of view of fastness, some desirable working properties of dyestuffs in the preparation of print pastes had to be sacrificed. A few products mentioned do not have the necessary solubility and suitable solvents should be tested to bring the color into complete solution.

It has also been found that in thickening agents, a number of products should be tested as one or the other gum may precipitate the dyestuff solution. On the average it has been found that synthetic thickeners are the least susceptible to additions of various solvents or acids. Finally, it has been found that the fixation of the products can be greatly enhanced if, after printing and drying, the material is given a short aging in the presence of acid fumes. This is then followed by the conventional steaming. The best and simplest printing formulation is as follows:

2%-2½ ozs.	Color dissolved in
2%-2½ ozs.	of suitable solvent, like Diethylene Glycol, Glycine A or Cellosolve, and
50%-2 qts.	boiling water.

This solution is then incorporated into a suitable thickener made up 100%-1 gallon; the thickener containing:

5%-7½ ozs.	urea.
3%-4 ozs.	ammonium sulfocyanide per gallon.

* These types are listed according to "Colour Index" number and name or prototype number and name. The reader is referred to the 1949 A.A.T.C.C. "Technical Manual and Year Book", or to their own supplier, for additional types.

Antimildew Treatment—

(Concluded from Page 151)

even after twenty-five launderings resistance to microorganisms is still far superior to that of the untreated fabric. Resistance to dry cleaning and to alternate exposures to ultraviolet light and washing is also high. This treatment appears suitable for both vegetable fibers and animal fibers. Mildew resistance and its permanence are functions of concentration of toxic agent employed, weight and type of fabric protected, conditions of application and severity of usage. By cognizance of this treatment it may be possible to extend the use of textiles to fields which it has lost, such as shower curtains; fields in which it is somewhat deficient, such as tropical fabrics; and finally to extend the horizon of textiles to fields in which it has never been much of a factor, such as irrigation duck, fungus-proof sheets or ticking.

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Metallized Dyestuffs—

(Concluded from Page 154)

same depth on wool as on nylon. Their suitability for mixtures of nylon and wool is, therefore, evident. We have to consider, however, that nylon has a certain point of saturation, so that the depth of shade which can be obtained with metallized dyes is limited. In pastel shades the nylon adsorbs usually more dyestuff than the wool. This selective affinity can be regulated by an addition of small amounts of Palatine Fast Salt N Conc. Powder, 0.5% being sufficient in most cases. Palatine Fast Salt N Conc. Powder has such a high affinity for nylon that with its help the dye can be transferred from the nylon to the wool even after the nylon has been dyed darker than the wool. Nylon, which is resisted with Nylonresist GDC is, in most cases, left white by Palatines when such fibers are mixed in with the wool.

While the manufacturers of nylon do not recommend the use of mineral acids for nylon, we do not see how sulfuric acid can be avoided if nylon-wool mixtures are to be dyed with Palatines.

Since a damage of nylon does not occur during dyeing, an aftertreatment with sodium acetate might possibly prevent a later deterioration of the nylon.

Thus we have seen that the Palatines have many desirable features, that they can be used with success in many instances and that this interesting group of dyestuffs might be designed to make the hard life of the dyer easier.

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Proceedings of the
American Association of Textile Chemists and Colorists

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MARCH 6, 1950

CALENDAR

COUNCIL

Meetings: April 14 (New York) June 9 (Montreal, Que.) Sept. 28-30 (Portsmouth, N. H. Convention) Nov. 17 (New York).

NATIONAL CONVENTIONS

1950: September 28 to 30, Portsmouth, N. H
1951: October 18 to 20, Statler, New York
1952: Boston.

MID-WEST SECTION

Meeting: May 6 (Schroeder Hotel, Milwaukee, Wisc.).

NEW YORK SECTION

Meetings: April 14, May 5 Kohler's Swiss Chalet, Rochelle Park, N. J.), June 16—Outing.

PHILADELPHIA SECTION

Meetings: March 31, May 5 (Kugler's, Philadelphia), June 9 (Annual Outing, Torresdale Country Club, Philadelphia), October 13, December 8, January 17, 1951.

PHILADELPHIA TEXTILE INSTITUTE STUDENT CHAPTER

Meetings: March 29, April 26, and May 24.

PIEDMONT SECTION

Meetings: April 1 (Robert E. Lee Hotel, Winston-Salem, N. C.), June 30-July 1 (Ocean Forest Hotel, Myrtle Beach, S. C.).

RESEARCH COMMITTEE

Meetings: June 9 (Montreal, Que.) Sept. (Portsmouth, N. H., Convention) Nov. 17 (New York).

RHODE ISLAND SECTION

Meetings: March 24 (Providence Engineering Society Hall, Providence, R. I.) April 28 (Providence Engineering Society Hall) May 26 (Johnson's Commodore Room, Providence, R. I.) October 27 (Providence Engineering Society Hall) November 17 (Johnson's Commodore Room)

SOUTH CENTRAL SECTION

Meetings: May 20 (Hotel Patten, Chattanooga, Tenn.) August 18-19 (Summer Outing—Read House—Hotel Patten, Chattanooga Country Club—Chattanooga, Tenn.).

SOUTHEASTERN SECTION

Meetings: May 27 (Columbus, Ga.), Sept 23 (LaGrange, Ga.) Dec. 9 (Atlanta, Ga.).

WESTERN NEW ENGLAND SECTION

Meetings: March 10 (Waterbury, Conn.), April 14 (Rapp's Restaurant, Shelton, Conn.) May 26 (Waverly Inn, Cheshire, Conn.) June 23 (Outing at Wallingford, Conn. Country Club).

EMPLOYMENT REGISTER

This column is open for two insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers, who can obtain further information from the Secretary.

50-3

Education: Evening and correspondence school courses in accounting, chemistry & dyeing, textile design and manufacturing.
Experience: 31 years laboratory technician and laboratory director in spinning mill.
Age 46; married; references; position in New England preferred.

2-20, 3-6

50-4

Education: Technical school, silk finishing.
Experience: 31 years superintendent of finishing.
Age 51; widower; vicinity of New York preferred.

2-20, 3-6

50-5

Education: New Bedford Textile Inst. and N. C. State College, B.S.
Experience: Chemist and Supt., dyeing and printing.
Age 28; married; references; will go anywhere.

3-6, 3-20

50-6

Education: Bradford Durfee Tech. Inst.
Experience: Textile chemist.
Age 26; married; references; will go anywhere.

3-6, 3-20

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Report of South Central Section

THE South Central Section held its first meeting of the year 1950 at the Hotel Patten, Chattanooga, Tennessee on February 18th. The meeting officially opened at 4:30 P.M. with a Technical Session; prior to this session a meeting of the Summer Outing Committee was held to discuss various details regarding the outing.

J. H. O'Neill introduced the first speaker, Dr. Carl Z. Draves of General Dyestuff Corp. New York, N. Y. who spoke on "Interpretation of Wetting Tests and Use of Photo Electric Timer" and Sidney M. Edelstein, Technical Director, Dexter Chemical Corporation, New York, N. Y. who spoke on "Wetting Agents and Their Evaluation." Dr. Draves and Mr. Edelstein answered questions proposed by members, and discussed various phases of wetting agent evaluation as requested by the members.

A social hour and banquet followed.

As after-dinner speaker, Dr. I. W. Grote, University of Chattanooga, gave a talk on "Wines, Liqueurs, and Cordials." Dr. Grote was presented by Andy Kelly, Burkart-Schier Chemical Co., Chattanooga, Tenn.

Jack Anderson reported to the Section on the recent Councilor's Meeting, after which the meeting was adjourned.

Attendance at the Technical Session was approximately 60 and approximatelv 90 members attended the banquet.

Respectfully submitted,
C. P. GORDON, *Secretary*

CANDIDATES FOR THE OLNEY MEDAL

In the rules for award of the Olney Medal there is provision for receipt of suggestions from members of the Association. Such will be welcomed; but they must be received at a date earlier than that named in the YEAR BOOK, to enable the committee to make its decision and give the Medalist and other speakers at the convention time for their plans.

A nomination received by the Secretary of the Association not later than April 11 will be transmitted to the voting members of the committee, and will be considered in this year's award. It should specify definitely the achievements of the candidate.

GENERAL RESEARCH COMMITTEE MEETING

JANUARY 13, 1950

THE 161st meeting of the General Research Committee was held at the Hotel New Yorker in New York, Friday, January 13, 1950.

Chairman J. Robert Bonnar called the meeting to order at 2 p.m. He welcomed the new chairmen of sub-committees. He requested that the chairmen of sub-committees appoint vice-chairmen as well as secretaries in order that new chairmen will be available when the present incumbent must be replaced according to the provisions of our Bylaws. He reported to the group that the Council at its morning meeting had approved an increase in the membership of the Executive Committee on Research. Mr. Bonnar stated that shortly there will be issued the names of a number of new committees functioning under the Sectional Advisory Research Committees. He sees this development of Sectional Research Committees as a splendid means of infusing new blood into our general research program. Mention was also made of the fact that temporary fastness tests will be published in the *American Dyestuff Reporter* and in the new *Technical Manual and Year Book*. He referred to the fact that we have been recently approached by the American Society of Mechanical Engineers in connection with a mutual interest in the field of the graphic arts. This is another instance of intersociety cooperation which indicates growing recognition of the research activities of A.A.T.C.C.

Mr. Bonnar introduced Leonard Little, who is an Association representative on an industrial group of the Federal Trade Commission considering requirements for water repellency. Mr. Little expressed the opinion that the Federal Trade Commission will probably accept recommendations which have been made by the group and that as a result the National Bureau of Standards shortly will circulate proposed new standards for water repellency. These standards will not be too different from those set up by our Association.

Mr. Bonnar mentioned the recent release by the Association of a report to its corporate members which summarized the activities of the General Research Committee and the Executive Committee on Research.

Mr. Bonnar then introduced Dr. Stearns who had attended, as our representative, a symposium on photochemistry in relation to textiles held recently in England. Dr. Stearns reported that he had attended this meeting in September, had brought greetings to the Society from the A.A.T.C.C. and had made comments indicating our interest in international standardization. The lack of response to the comments on this latter point indicated that international standardization is not a matter of particular interest in England. He reported that, in general, in England and on the Continent, there is great emphasis on the necessity for making light fastness exposures to the sun rather than in Fade-Ometers or similar instruments. From his observation, however, this seems to be a policy or theory rather than their practice, as Fade-Ometers or equivalent instruments are evidently very generally used. Dr. Stearns referred particularly to a statement made by one man at the symposium to the effect that 15% of the comparative tests showed that the Fade-Ometer did not agree with sunlight exposures. The emphasis seemed to be on the ones that did not appear to agree, ignoring the fact that 85% of them must have been in agreement. Where instruments are used for exposure tests European practice favors the use of the cloth standards to measure light exposure rather than attempted calibration of the instruments. As nearly as Dr. Stearns could determine there is some disparity in practice, as one group exposed until the first slight discoloration is evident and in this instance the degree of discoloration seemed to be equivalent to that specificed by A.A.T.C.C. as being "appreciable." The Society of Dyers and Colourists prescribed a "real good fade" which by observation Dr. Stearns interpreted to be two to three times as much fade as the A.A.T.C.C. standard. Another group worked on the basis of achieving a fade equivalent to 50% of the amount of the original color, which in Dr. Stearns' opinion is 10 to 20 times as much fade as is called for by our practice. After Dr. Stearns' comments, both Messrs. Bonnar and Appel pointed out that there is definite evidence that international standardization is developing, although it is admitted that progress is inherently slow.

At this point Mr. Bonnar turned the meeting over to Dr. Harold W. Stiegler, who stated that so far as the work at Lowell is concerned most of the results will be reported individually by the several committee chairmen. The work on the delivery date of nozzles for the Water Repellency Committee is continuing and is almost completed. With reference to the work for the Wash Fastness Committee the high speed Accelerator has been pretty well developed and an announcement will shortly be made of the details. Work for the Flammability Committee has been a continued study of the testing instrument from the point of view of improving convenience of operation. Dr. Stiegler also asked the cooperation of the chairmen of the research committees in returning the names of the committees for listing in the *Technical Manual and Year Book*. He also requested careful review of methods in order that errors may be prevented in the *Year Book*.

SUB-COMMITTEE ON CHLORINE RETENTION.—A. W. Etchells, the outgoing Chairman, made the report. He stated that fabrics have been treated with six different resins, some of which are known to be chlorine retentive and some which are known not to be. These have been treated with chlorine under various conditions covering a wide range of concentration, time and temperature. The effect of drying temperature has been evaluated and has been found to be relatively little within reasonable limits. The apparatus for heat-treating cloth has generally been the Suter tester. In its usual form this equipment has been found to lack the proper controls so the committee has made up its own apparatus which is a variation on the standard Suter tester. Mr. Etchells stated that the test method will be available within a couple of weeks, and after it has been approved will be published in the *American Dye-*

stuff Reporter in order to get trade reaction. At this point, Mr. Etchells introduced the new chairman of this committee, J. Epelberg, who explained the new apparatus. The Suter tester normally provides only for the heating of the bottom section whereas the committee has provided additional means for heating the top section or cap with temperature control. It is the belief of the committee that the revamped tester should be built for something in the neighborhood of $150 to $200, possibly less. A number of questions were asked from the floor about the new piece of equipment.

SUB-COMMITTEE ON SNAG RESISTANCE.—Dr. J. Edward Smith reported that four of the seven members of his committee attended a meeting on the 12th of January and that David Cook was elected secretary. Dr. Smith pointed out that his committee had operated on a stand-by basis awaiting the results of the work of the comparable A.S.T.M. subcommittee. The latter has been polling its members with the intention of setting up the sand paper test as a tentative standard method. If the A.S.T.M. Committee does this, it is expected that our committee will also set up the same method as a tentative standard method. Dr. Smith pointed out that there are two other instruments for determining snag resistance; one put out by the U. S. Testing Company, the other by the National Association of Hosiery Manufacturers, and that the three instruments do not always agree. Attempts to correlate results must consider a number of factors as the different instruments may emphasize certain of these factors more than others. At least two of the factors involved are: (1) the force required to engage the fabric in the various instruments and (2) the force required to produce a pulled thread.

The committee is planning a program of comparative testing on these three machines with the intention of developing a standardized method to determine the gram-force required to produce a pulled thread in a hosiery fabric, considering yarns of all deniers, both multifilament and monofilament. After this is done they expect to select materials which markedly change the force required—one which will cause a decrease in the force and the other an increase. Application of these materials will be made to stockings in the greige as well as those dyed and finished, and they will be evaluated according to the three test methods. The results of this work should indicate the desirability of any future program. Mr. Freedman asked whether the committee had considered the matter of orientation of the sand paper in the tester. He has found that there is a difference in results depending upon how the sand paper is placed in the holder. Dr. Smith stated that the committee will note this comment and add this consideration to their program.

SUB-COMMITEEE ON FASTNESS TO LIGHT.—Charles A. Seibert, the new chairman of this sub-committee stated that during the past year most emphasis had been placed by the committee on the calibration of the Fade-Ometers and on the comparison of A.A.T.C.C., British and German-Swiss standards for light fastness. With reference to the work on the G. E. Photon Counter as a means of Fade-Ometer calibration, it has been found that this instrument in its present form is not sensitive to temperature and humidity variations. The committee has found that the NBS blue calibration papers represent the best method yet developed for calibration of Fade-Ometers. Approximately one year's experience indicates general satisfaction. Since a new supply must be prepared, the National Bureau of Standards stated that they believe they can develop an improved paper if the Executive Committee on Research will inform them in writing of their desire to have the work done. Incidentally, the Bureau has found that extremely rapid fading lamps produce misleading results compared with lamps which operate more nearly like the standard lamp. This matter will be further studied and mention of the fact will be made in the next *Technical Manual and Year Book* in order that it may serve as a caution to users of Fade-Ometers.

Referring to the many complaints that Fade-Ometers and natural light exposures do not always agree, Mr. Seibert referred to his program as a research assistant of the Association to study this matter in cooperation with the Atlas Electric Devices Company. The Atlas people will continue their work to improve the instrument mechanically and electrically, and much work that they have already done will be incorporated so that at the end of the program full value will be obtained of their work. The National Bureau of Standards will continue work to improve the means of calibrating the instrument and Mr. Seibert, for the A.A.T.C.C., will specifically study colors which are known to show variation between Fade-Ometer and natural light exposure. He expressed interest in having samples of dyes or materials which are known to vary in order that he might include them in his program. He stated further that Dr. Godlove's report on the spectro evaluation of the faded cloth standards is expected to be available in the near future and that copies will be distributed to England and other European countries. Mr. Bonnar welcomed Mr. Seibert as an A.A.T.C.C. worker and stated that the Association's investment is really small compared with the vast amount of work that Atlas has already done. It is expected that as a result of all this work a new lamp eventually will be made available.

SUB-COMMITEEE ON WASH FASTNESS.—Mr. Seibert reported that a tentative test method has been developed, that the new jars and adapters for the Launder-Ometer have been made available and that five different laboratories are using them to make tests on 20 selected fabrics. The committee feels that their method yields results sufficiently close to those resulting from five average commercial launderings so that the test appears acceptable. There is, however, some confusion on interpreting the results of the tests and further study must be given to this aspect. Previous reference has been made to the desirability of getting consumer reactions in order to determine a reasonable measure of permissible change in color from laundering. This would include also the evaluation of physical damage to the material in comparison with color damage, and should result in a determination of how many launderings colored fabrics do average during their useful life. This program was to be conducted by a committee of the American Standards Association and in response to a question, Charles W. Dorn stated that the committee has made no report. He is planning to get into touch with them to try to get this report which may assist the Wash Fastness Committee.

SUB-COMMITTEE ON STANDARD SOIL.—E. A. Vitalis reported that his committee has run comparative detergency tests in six laboratories on two soiled fabrics—one being from Testfabrics, Inc., and the other from the U. S. Testing Company. Five different detergents were used and the results were good in agreeing at least on the order of excellence of the detergents compared with soap, but reflectance readings varied widely among the cooperating laboratories. Variations amounted to 10% or more, even on the original fabrics. This indicates the need for further calibration of instruments by appropriate methods. The reflectance of soiled fabrics will hereafter be tested in one laboratory, and fabrics in which any portion varies more than plus or minus 1% of the average reflectance are to be discarded. Attempts will be made to determine what variation in reflectance is permissible. The program will be simplified by using only two detergents and only one soiled fabric in order to derive data which will permit the determination statistically of the number of results necessary to meet the rigid requirements indicated. It is expected that this will result

in final specifications. Mr. O'Neil commented that there should not be too much need to worry about differences between laboratories or instruments. If any instrument or any laboratory gets results within itself which are consistent it should be satisfactory for the purpose of the program. Dr. Lynn also commented that the apparent differences found by the committee are not really as great as they seem to be.

SUB-COMMITTEE ON FIRE RESISTANCE.—In the absence of James R. Redmond, Dr. Stiegler stated that a written report would be available for later publication.

SUB-COMMITTEE ON VISUAL AIDS.—F. J. O'Neil stated that his committee had reviewed their problem and concluded that the first step which they must decide upon is to determine the kind of change which has taken place in a given sample. This they have thoroughly reviewed and conclude that, in general, changes are not simple variations in depth but also involve changes in hue and chroma; in other words, it is possible for samples to change or fade in all directions. This seems to qualified persons to be over-simplification but Mr. O'Neil states that these points are not so clear to the people who most need to use the aids to visual judgment. His committee has concluded that changes in hue are not getting enough emphasis. The Aklo glasses will take care of changes in strength, but not changes in hue. His committee must now investigate all methods for evaluating changes in hue, adapt this information and find some practical, simple method of utilizing the data. Mr. Bonnar commented that this is not too simple a job. Undoubtedly a scientific approach will be needed and then will follow the more difficult conversion to a simple but practical level. Robert W. Joerger inquired whether the use of Munsell color numbers before and after may be a good method of indicating change. Dr. Stearns pointed out that there are only 1,000 Munsell color chips, whereas there are 10,000,000 variations in color discernible by the human eye. Dr. Stiegler commented to the effect that we are occasionally approached by individuals or associations for help in determining whether something will be acceptable so far as color change is concerned. Up to the present time we have not been able to help the inquirers.

SUB-COMMITTEE ON ATMOSPHERIC FADING.—Herbert G. Scull reported that although his committee is officially a reference committee it has been relatively active. Basically the problem in atmospheric fading is evaluating the color change due to exposure. The present A.A.T.C.C.-sponsored instrument requires from six to 16 hours for a standard test. Mr. Scull has had considerable work done with an instrument which will give a test in three or four minutes, and had in fact brought for our inspection the instrument which was developed by James Greer of Burlington Mills. He introduced George W. Wernz of A. M. Tenney Associates, who has done extensive work on this new instrument. Mr. Wernz pointed out that methods depending upon the action of acid on potassium or sodium nitrite have been demonstrated to be fast but undependable in results. In this instrument gaseous NO_2 is metered into a sort of chimney at the bottom of the instrument. He showed a 1-lb. cylinder which is available, but stated that in his laboratory he is using a 20-lb. cylinder of the gas which has lasted more than six months in their testing work. A gas flame below the chimney provides heat. The instrument is provided with a fan for circulation and an automatic timer. The samples are suspended from a rotating squirrel type cage. Mr. Wernz stated that he prefers to furnish the NO_2 at such a rate that the test will require ten minutes. There is no vent in the instrument, in fact a very good closure, so that the gasses remain in the box which resembles a laboratory drying oven in appearance. Results with this instrument agree with those secured in a much longer time in the present A.A.T.C.C. tester.

At this point Dr. Stiegler referred to cooperative work with Princeton Knitting Mills in obtaining pile fabric materials. He then called upon Kenneth Barnard to report for the FLAMMABILITY SUB-COMMITTEE. Mr. Barnard referred to the fact that many of the inclined testers are in use in the trade and a great deal of data has been assembled. Furthermore the work at Lowell in refining the equipment had resulted in a new machine being built which after extensive tests gives no different results from those being determined in the trade on the old tester. This indicates that the old machine is capable of giving reproducible results and many of the differences formerly indicated or suspected have disappeared. The instrument is more accurate than was previously thought and the biggest contribution is in refinement of methods of preparing the samples for the test. A final report giving all of these data will shortly be issued.

Mr. Barnard also reported that the SUB-COMMITTEE ON DURABILITY OF FINISHES had a meeting and expected to present a summary of their interlaboratory tests at the next general meeting of research committees in April. Seven standard samples have been examined on both the Monsanto and American Cyanamid testers. Statistical work on the results of these tests is now going on.

Mr. Bonnar asked Mr. Dorn to discuss a matter which has resulted from the latter's work on an American Standards Association Committee. Mr. Dorn stated that in attempting to set up standards for rayon fabrics which should cover end-use requirements, the cost of testing, and using the several individual tests indicated to be desirable, posed a problem. Several people working on this have concluded that it would be simpler to select individual tests which might be considered to cover several end-use requirements. This might be referred to as a program of combining testing. Mr. Dorn felt that A.A.T.C.C. could well explore the possibilities in this field, as it would result in an agreement on a restricted program of testing rather than specifying so many individual tests. Mr. Scull questioned the possibility of agreeing on one test as it would probably be too circumscribed in its applicability. Mr. Dorn indicated that there was no arbitrary decision reached thus far but that it appeared a fruitful field for investigation.

Dr. Stiegler, in conclusion, stated that the detergency comparator has been announced and that full details will shortly be made available. In any case, one of these comparators is available at Lowell for testing purposes if responsible individuals or groups are interested in using it.

It was announced that future meetings of the General Research Committee are scheduled for April 14, June 9, September 28-30 and November 17, 1950.

There being no further business the meeting adjourned at 3:30 p.m.

Those present were:

J. R. Bonnar, *Chairman.*
H. W. Stiegler, *Research Director.*
G. H. Schuler, *Secretary.*

E. J. Allard
W. D. Appel
K. H. Barnard
W. H. Cady
J. J. Carnes
J. T. Cassaday
H. C. Chapin
H. M. Chase
J. N. Dalton
C. W. Dorn
C. Z. Draves
J. Epelberg
A. W. Etchells
F. E. Fleming
E. Freedman
J. M. Gould
O. B. Hager
S. L. Hayes
A. K. Haynes
A. E. Hirst
W. A. Holst
R. W. Jacoby
R. W. Joerger
N. A. Johnson
A. J. Kellner
M. T. Klein
D. P. Knowland
G. O. Linberg
J. E. Lynn
O. F. Marks
W. R. Moorhouse
J. E. Norton
A. D. Nute
F. J. O'Neil
B. A. Ryberg
H. A. Scruton
H. G. Scull
C. A. Seibert
J. H. Skinkle
J. E. Smith
E. I. Stearns
R. B. Stehle
J. A. Stevenson
H. H. Taylor

F. J. Traut
P. Theel
F. Tripp
F. R. Tripp
E. A. Vitalis
J. F. Warner
G. Wernz
S. H. Williams
G. H. Wood
P. J. Wood
H. L. Young

GEO. H. SCHULER, *Secretary*

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Concentrates From The Report of The Research Director

AT Lowell our research staff is required to be very versatile. It is not large enough to be departmentalized, but a great variety of activities must be covered.

The wash fastness program has resulted in a determination of desirable changes in Launder-Ometer accessories and the development of a test which will predict the effect of commercial laundering. It has also developed a new high speed instrument which will be useful for predicting abrasion characteristics of textile materials.

THE flammability program, after extensive tests of the inclined plane A.A.T.C.C. tester, seeking to improve it, developed the fact that in its present form it is a good instrument. Much was discovered in connection with precise manipulation so that when the report is published information will be available to users of the instrument which will assist them in arriving at concordant results.

LOWELL has standardized nozzles for the A.A.T.C.C. rain tester and determined flow rates for each one. A report on the water repellency program will shortly be made which should be interesting reading to those engaged in testing for water repellency.

THE Research Director reports progress on the reactiveness of the American Viscose Fellowship.

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Report of Pacific Southwest Section

THE Pacific Southwest Section held its regular technical meeting and dinner at 7:00 P. M., January 27, 1950, at the Los Angeles Athletic Club in Los Angeles, California.

Fifty-five members and guests heard W. W. Chase, of Interchemical Corporation, Fair Lawn, New Jersey, give a talk on "Pigment Printing," after which he showed a motion picture in color, with sound, entitled "Pigmented Emulsions for Textile Printing."

Respectfully submitted,
T. L. WILHELM, *Secretary*

Report of LTI Student Chapter

AT the fourth meeting of the college year of the Lowell Textile Institute Student Chapter, held on February 1, 1950, the following program was outlined:

Wednesday, February 8—a movie entitled "Modernization of the Textile Industry."

Thursday, February 9—a lecture by Roland E. Derby on the application of the ammonia neutralizing process in wool finishing.

Wednesday, February 15, an Intercollegiate Chemical Society meeting at Harvard; lecture by Dr. George Kystiakowski on the nature of explosives and explosions.

Plans for the meeting and banquet to be held at the Institute on Friday, April 21, were furthered.

Chairman Rebenfeld presided at the meeting.

Respectfully submitted,
DOROTHY A. McCARRON, *Secretary*

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Points of Color Committee Report

DR. E. I. STEARNS, Chairman of the Committee on Color, has furnished a report of the activities of his committee. Currently they are cooperating with the National Bureau of Standards in the preparation of tentative standards for spectrophotometric methods of testing dyestuffs. They are also engaged in a comparative study of the relative merits of the several color measuring instruments now on the market, the purpose of which is to compare the sensitivity of the instruments with the sensitivity of the eye.

The Committee on Color also has cooperated with the Committee on Light Fastness in measuring instrumentally the light fastness standards of the German, British and American societies and expressing in numerical terms the color differences in the faded and unfaded standard fabrics. An article will be prepared for the *American Dyestuff Reporter* by Dr. Godlove for early release. The committee is continuing its close cooperation with the Inter-Society Color Council.

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Seibert Appointed Research Associate

CHARLES A. SEIBERT, who recently retired from the Du Pont Company, has been appointed a research associate by A.A.T.C.C. He is engaged in a program of evaluating differences in fading as between Fade-Ometer and sunlight exposures. It is expected that from this work and the data worked out by Atlas Electric Devices Co. improvement can be made in the Fade-Ometer which will eliminate many of the differences or anomalies now known to exist.

He is also chairman of the Subcommittee on Light Fastness and continues his active participation in the work of the Subcommittee on Wash Fastness.

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Rhode Island Section Program Schedule

THE Rhode Island Section has released its program schedule for the remainder of the year as follows:

Friday, March 24th—Meeting at Providence Engineering Society Hall, 195 Angell St., Providence. H. B. Sturtevant, R. I. School of Design—"Textile Education Is Modern." H. W. Stiegler, A. A. T. C. C. Director of Research—"The A. A. T. C. C. Research Program."

Friday, April 28th—Providence Engineering Society Hall. To feature wool and synthetics. Speakers to be announced.

Friday, May 26th—Dinner meeting at Johnson's. Program to be announced.

Friday, October 27th—Providence Engineering Society Hall. R. I. Intersectional Contest Paper on Printing. Speaker to be announced.

Friday, November 17th—Dinner meeting at Johnson's. Dr. Martin Horan, R. I. College of Education. Topic to be announced.

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Report, North Carolina State Student Chapter

THE North Carolina State College Student Chapter held its first meeting of the winter term on February 2, 1950. The main speaker of the evening was Hillary Robinette, Jr., Research Director of Amalgamated Chemical Corporation, whose subject was: "Nonionic Compounds and Their Application in the Textile Industry." Mr. Robinette gave a complete introduction to the chemistry of nonionics, explained using slides, and reviewed what can and has been done in the industry with nonionics.

In the visiting group, along with Mr. Robinette, were John Neely, Clarence Hooper, Charles Ordway (all of Burlington Mills) and Robert Bruce, Vice President and Treasurer of Amalgamated Chemical Corporation, all of whom joined in the discussion.

During the business meeting preceding the talk, Chairman Reynolds Carnevale announced that the N. C. State Chapter will take charge of the Spring meeting of the Piedmont Section in Winston-Salem. At that time the student chapters of the Piedmont Section will present their own research papers.

Respectfully submitted,
E. H. ASPINWALL, JR., *Secretary*

ONE HUNDRED AND SEVENTIETH COUNCIL MEETING

THE Council held its 170th meeting in the Hotel New Yorker, New York, N. Y., on Friday morning, Jan. 13, 1950. Present were President C. Norris Rabold, presiding; Arthur W. Etchells and George O. Linberg, Vice-Presidents; William R. Moorhouse, Treasurer; J. Robert Bonnar, Chairman of the Research Committee; William D. Appel, William H. Cady, Carl Z. Draves, Henry F. Herrmann and P. J. Wood, Past Presidents; John M. Gould, C. Wendall Lever and Frank J. O'Neil representing Northern New England; Edward J. Allard, Raymond W. Jacoby, Robert W. Joerger and George H. Wood representing Rhode Island; Charles W. Dorn, William A. Holst and Paul J. Luck representing New York; James Dixon, Walter F. Fancourt 3rd., Onslow B. Hager, Morris T. Klein, Frederick V. Traut and Jackson A. Woodruff representing Philadelphia; Wyss L. Barker, John B. Neely and Sumner H. Williams representing Piedmont; A. Kempton Haynes representing Southeast; Jack Anderson representing South Central; Frederick E. Hilger representing Mid-West; Harold H. Taylor representing Western New England; Albert E. Herrmann, Jr. repesenting Hudson-Mohawk; Kenneth H. Barnard of the Convention Committee; Patrick J. Kennedy of the Intersectional Contest Committee; Leonard S. Little of the President's Advisory Committee; J. Edward Lynn, Chairman of the Western New England Section; George H. Schuler of the Publicity Committee; Edwin I. Stearns of the Committee on Color; Richard B. Stehle, Chairman of the Philadelphia Section; Harold W. Stiegler, Research Director; Percival Theel, of the Publicity Committee; and Harold C. Chapin, Secretary.

The Secretary's report of the 169th Council meeting and financial report of Jan. 3, and the Treasurer's report of Jan. 4 were accepted. The Appropriations Committee was authorized to invest between $50,000 and $60,000 of reserve funds in short term securities, and to invest $2000 of the Howes Prize Paper Fund. Mr. Herrmann reported, and received approval of progress on the contract for the new *Colour Index*. Though this is expected to yield eventual financial profit, it will tie up most of the Association's available funds while in process of publication.

The following proposed substitute for Article VIII, Section 1, of the Constitution was received; duly sponsored, and approved by the Committee on Constitution and Bylaws. Approved by the meeting, it will be subject to ballot of the entire Senior membership of the Association in October.

"A proposal to amend this Constitution may be presented at any time to the President or Secretary of the Association. It must be in writing and signed by one hundred or more Senior members, of whom the first shall be designated in connection with his signature as the Original Proponent.

"At the first meeting of the Council following receipt of the proposal, it shall be presented by the President or Secretary for discussion and shall be referred to the Committee on Constitution and Bylaws. This committee may make minor changes approved in writing by the Original Proponent, and shall report at the next following Council meeting, at which meeting the Council shall express its approval or disapproval by majority vote.

"In the form on which the Council voted, together with a record of that vote and a statement from the Original Proponent of the purpose of the amendment, the proposal shall be published in the next available issue of the Proceedings of the Association; and accompanied by printed copy of this record of vote and statement, it shall be submitted to vote of the entire Senior membership of the Association on ballots mailed with the next ballots issued for election of officers of the Association; except that at any time prior to such mailing the proposal may be withdrawn by the Original Proponent through written statement to the Secretary of the Association; and except that earlier balloting may be prescribed through request embodied in the original signed proposal and approved by the Council in connection with its vote on the proposal.

"Affirmative votes on two-thirds of the ballots returned within six weeks of mailing, and from not less than twenty-five percent of the Senior membership, shall make the amendment effective at once. If these requirements be not met in the first six weeks, additional ballots received in the next six weeks shall be counted."

At the request of the Treasurer, and of the Chairman of the Executive Committee on Research, respectively, the two following proposals to amend the Bylaws were presented by the Committee on Constitution and Bylaws, and were thus quali-

SECRETARY'S FINANCIAL REPORT, JANUARY 3, 1950

	Applications	*Dues, Regular & Reinstate*	*Dues, Corporate & Sustaining*	*Miscellaneous*	*Totals*
Received and transmitted to Treasurer,					
August 1 to October 3, 1949	$ 656.00	$ 118.00	$ 0.00	$ 2,466.16	$ 3,240.16
October 3, 1949 to January 3, 1950	1,887.00	29,368.50	22,775.00	11,469.79*	65,500.29
Totals in fiscal year to January 3, 1950	2,543.00	29,486.50	22,775.00	13,935.95	68,740.45
Leaving deposited by Treasurer with Secretary					5,723.11
Miscellaneous items					*
Dividends and interest					$ 898.45
Reporters & reprints					83.17
Dry cleaning kit					3.00
Year Books					709.50
Crockmeters					557.50
Crock cloth					215.25
Multifiber cloth					304.88
Moth cloth					183.00
Water test apparatus					91.00
Dyed standards					37.00
Knitted tubing					19.25
Gas Fading units					43.50
Buttons					18.00
Color transfer charts					49.50
Colour Index					90.00
Analytical Methods					3,889.60
Registrations, Atlantic City, net					1,268.54
Howes Publishing Co., prize paper fund					2,000.00
N.R.D.G.A., Flammability research					1,000.00
Rebate on gas cylinder					9.44
					11,470.58
Bank charges					.79
					11,469.79

fied for letter ballot of the Council, with the indorsement of the meeting.

In Article IV, Section 8, to avoid requirement that the Treasurer serve on the committee, make the first sentence read, "The Committee on Constitution and Bylaws shall consist of the Secretary and two other Senior members appointed by the Council."

In Article IV, Section 2, in order to increase the members of the E.C.R. from six to nine, substitute for the first two sentences the following—

"The Executive Committee on Research shall be composed of the President of the Association, the retiring President, the Chairman of the Research Committee (appointed by the Council as provided in the Constitution), and six Senior members appointed by the Council, each for such term, not exceeding five years, as will permit each year two new appointments for terms of three years each. No such appointed member shall serve in that capacity more than five years consecutively."

If the second proposal be adopted by the required affirmative letter ballots of two-thirds of the Council, the present Executive Committee on Research recommends the appointment to this committee of John N. Dalton for five years, Walter M. Scott for five years, and James A. Stevenson for three years.

On motion of the Treasurer it was voted that Albert E. Sampson be appointed Assistant Treasurer of the Association, and be authorized to sign checks; that he be bonded in the same amount that the Treasurer is now bonded; that he be responsible to the Treasurer, but if the Treasurer should become incapacitated, that he assume the full duties of the Treasurer until such time as the Treasurer is able to resume his duties or until the Council appoints a new Treasurer.

Committees were appointed, or stand, as follows—

Executive Committee on Research

J. R. BONNAR, *Chairman*
M. A. Dahlen — H. F. Herrmann
C. W. Dorn — C. N. Rabold
P. Theel

Publicity

P. J. LUCK, *Chairman*
G. H. Schuler, *Vice-Chairman*
Others to be appointed on recommendations of Sections.

Appropriations

W. R. MOORHOUSE, *Chairman*
H. C. Chapin — T. R. Smith
C. Z. Draves — P. J. Wood

Membership and Local Sections

A. W. ETCHELLS, *Chairman*
H. C. Chapin — G. O. Linberg

Publications

P. THEEL, *Chairman*
W. H. Cady — R. W. Jacoby
H. C. Chapin — N. A. Johnson
C. Z. Draves — P. J. Luck
G. H. Schuler

Corporate Memberships

G. O. LINBERG, *Chairman*
G. L. Baxter, *Vice-Chairman*
Others to be appointed on recommendations of Sections.

Constitution and Bylaws

H. C. CHAPIN, *Chairman*
C. Z. Draves
W. A. Holst (provided Bylaw be amended as above)

Merchandise

C. NORRIS RABOLD, *Chairman*
J. R. Bonnar — W. R. Moorhouse
H. C. Chapin — H. W. Stiegler

Conventions

K. H. BARNARD, *Chairman*
B. C. Bond — G. O. Linberg
C. W. Dorn — P. J. Luck
W. F. Fancourt, 3rd — D. C. Newman
S. L. Hayes — G. H. Wood

Technical Programs

W. G. PARKS, *Chairman*
K. H. Barnard — A. W. Etchells
H. Boxser — H. E. Hager
M. A. Dahlen — V. B. Holland
F. Dannerth — R. W. Jacoby
S. J. Davis — A. D. Nute
S. H. Williams

Intersectional Contest

F. J. O'NEIL, *Chairman*
J. R. Bonnar — P. J. Kennedy
R. E. Hale — E. D. McLeod
T. R. Smith

President's Advisory Committee

L. S. LITTLE, *Chairman*
W. D. Appel — S. L. Hayes
J. R. Bonnar — H. F. Herrmann
W. H. Cady — W. A. Holst
H. C. Chapin — E. H. Killheffer
C. W. Dorn — G. O. Linberg
C. Z. Draves — W. R. Moorhouse
A. Eavenson — C. N. Rabold
A. W. Etchells — T. R. Smith
P. J. Wood

Representative on Intersociety Council for Textile Research

C. Z. Draves
W. A. Holst, *Alternate*

Colour Index

W. H. CADY, *Chairman and Coordinator*
E. R. Laughlin, *Secretary*
W. D. Appel — J. R. Bonnar
W. C. Bainbridge — H. M. Chase
A. F. Clark — A. Morrison
J. L. Crist — A. L. Peiker
R. E. Derby — R. W. Powell
F. R. Haigh — C. H. A. Schmitt
W. A. Holst — T. R. Smith
R. W. Jacoby — B. M. Van Cleve
D. P. Knowland — W. von Bergen
W. R. Moorhouse — P. J. Wood

It was voted that the next Council meeting be in New York on April 14, the next as previously planned in Montreal on June 9, the next in connection with the convention, and the last for the year in New York on November 17. A general schedule for future years was suggested by the President, approved in principle, and referred to W. L. Barker, R. W. Joerger and J. Dixon as a committee to recommend details. An invitation was received from the Piedmont Section, to meet in the South in April, 1951.

Mr. Barnard reported on arrangements for the June Council meeting in Montreal, and on conventions. Mr. Fancourt made his final report on the Atlantic City convention, and was given a vote of appreciation for transmission to his Philadelphia committee.

Mr. Linberg reported for the Corporate Membership Committee, and Dr. Stearns on the recent Symposium on Photochemistry which he had attended in England. Professor Theel reported that the Publications Committee had appointed Dr. Draves Editor of the *Proceedings*, and Mr. Cady Editor of the *Year Book*. The committee was working on rules, in hope of making, at the next convention, the first Howes Award for a paper published in the Proceedings.

For the Committee on Membership and Local Sections, Mr. Etchells presented the petition of the Pacific Coast Section to change its name to Pacific Southwest, which was approved. The eligibility of properly sponsored foreign students to Student membership was confirmed. Elected to Corporate membership were Naumkeag Steam Cotton Company and Ultra Chemical Works, Inc. Each of the following was elected to the class of membership specified, as of thirty days from publication of application, provided no objection be received meanwhile by the Secretary.

SENIOR

C. L. Ainsworth — J. F. Bourdon
A. J. Baron — G. H. Braniff
S. J. Baum — G. C. Brewin
C. J. Beach, Jr. — L. Bulova
R. R. Beaudoin — W. T. Burke
R. P. Beaven — J. J. Burns
H. G. Bethards — H. Byers
H. Betz — B. R. Cano
J. Bianco — G Cocoros
M. Bommer — H. T. Cole

G. H. Coleman
F. E. Condo
N. J. Conte
J. Corominas
L. H. Crosson
T. N. Crowley
A. A. Curt
T. D. Cushway
J. E. Dean
V. J. DeCesare
R. DeMarco
H. A. Dufresne
C. R. Eichorn
R. L. Erlandsen
K. H. Ferber
G. R. Ferguson
J. P. Ferguson
W. J. J. Fiory
I. Fischer
A. D. Fisher
J. L. Furey
R. A. Gale
B. J. Garceau
H. Gardner
W. W. Gilchrist
M. Grayson
C. A. Green
V. M. Gulledge
T. J. Hall
D. A. Hawn
O. W. Heim
D. H. Henderson
J. J. Hershfeld
L. V. Hilyard
R. A. Hoffman
C. R. Huber
E. D. Hunter
F. A. Huntress
W. W. Ingenthron, Jr.
E. W. Jones
J. G. Kelley
I. H. Kinsey
C. E. Kip
W. C. Laucks, Jr.
W. C. Lee
F. R. Lent
J. Lichtman
R. Liddle
G. H. Liebig
S. J. Ljungkvist
A. L. Logan
W. K. Lydic
R. W. Macdonald
R. V. Martin
J. H. Mathewson
E. W. McCarty
R. F. McKown
S. W. Mead
J. C. Merlini
H. Messer
M. Michaelian
J. H. Michell
L. R. Mizell
W. N. Nakajima
R. C. Nelson
R. C. Newman
M. H. Newton
A. F. Noe
E. Parker
J. N. Parker
R. S. Peabody
H. F. Peterson
O. S. Plantinga
W. H. Poisson
W. Porschen
C. A. Reese
R. J. Reynolds
H. J. Rodway
L. C. Roome
A. P. Royle
H. F. Sherman
A. K. Skjetne
R. Smith
L. Sonneborn
C. W. C. Stein
W. R. Stuckey
N. Szekely
G. J. Taylor
J. C. Thomas
G. S. Thomson
P. E. Thorson
C. P. Thuot
I. Tirkfield
J. F. Troy
W. I. Upson
C. J. Vickers
F. M. Viles
F. A. Walasewicz
J. W. Watters
W. G. Webb
C. O. Werner
A. Willim
A. R. Winch
F. E. Wintzer
J. Wolfenstein
G. Yacano
V. E. Yanes
W. J. Zeuren

JUNIOR

E. Artim
E. G. Baker
W. S. Barnes
H. G. Bodin
E. W. Boland
W. T. Bueltman
R. F. Cernik
F. R. Cloos
J. L. Crist, Jr.
A. Cuplinskas
W. D. Dickey, Jr.
B. H. Drummond
R. F. Garrett
J. W. Gordon
H. V. Hadfield
F. G. Hewit
J. F. Kneeland
J. Massarene
R. E. Milana
S. L. Mistretta
F. L. Moskal
R. J. O'Brien
J. J. Osmar
P. J. Pernice
J. C. Picken
H. M. Randolph, Jr.
C. R. Ring
M. H. Smith, Jr.
J. Theodosopoulos
R. F. Turner, Jr.
W. Wald
C. E. Williams

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A. D. Baillie
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H. G. Olson
T. B. Piana
I. Pollak
R. Q. Ranson
P. Van S. Rice
H. C. Royce
E. V. Spencer
W. H. Stone
A. H. Todd
M. E. Walach

STUDENT

W. T. Ambrogi, Jr.
D. C. Anderson
O. N. Arslan
A. S. Ashley
R. Baldecchi
G. F. Barry
J. V. Bennett
J. E. Bresnahan
J. S. Brice
J. V. Brice
J. L. Bridgeman
F. D. Brown
H. I. Brown
R. W. Burbank
A. Carter
T. Carter
E. A. Chwatt
H. W. Cohen
S. H. Cohen
C. E. Coleman
R. L. Coleman, Jr.
B. D. Corbeil
A. C. Corwin
A. W. Cowan
F. J. Craven, Jr.
L. R. Croce
R. E. Crowell
B. O. Dickison
C. F. Donyes
J. J. Ducharme
A. A. Dunham
B. G. Estes
G. H. Eudy
A. L. Ferreira
D. P. Feyler
I. W. Feyler, Jr.
F. A. Flynn
G. B. Fowler
L. S. Gifford, Jr.
L. I. Gilman
E. Goldstein
R. P. Griffin
D. B. Groves
W. A. Grunberg
M. N. Hahn
S. R. Hall, Jr.
J. O. Hammond
C. A. Handal
J. H. Handley
H. C. Hart
R. E. Hart
F. L. Hartman
S. Heisler
F. B. Hennessey
D. Herman
F. M. Hinds
W. L. Hochner
T. L. Howle, Jr.
W. Isherwood
G. Jacob
D. A. Jewell, IV
H. F. Keels
R. T. King
J. W. Kirk
J. Klein
V. Kota
W. E. Kramer
W. H. Lawson
J. W. Lentz
D. Leshin
A. H. Lightkep
D. A. Lima
J. L. Link
D. S. Linz
H. M. Linz
M. Linzer
D. L. Lyle
E. W. Makuch
J. F. Marshall
P. Martell
D. J. McCartney
H. L. Mercer
A. J. Mignerey
C. D. Nelson
R. A. Normandin
J. T. O'Donnell
R. V. Partington
R. L. Polk
H. J. Prensky
R. M. Profio
G. M. Randolph
W. A. Renaud
S. J. Rexon
D. R. Roberts
W. T. Roff
H. A. Roselle
R. H. Rosenberg
J. Rosenfeld
G. Roux
H. E. Rubin
T. G. Rudman
Y. P. St. Louis
M. A. Sanborn
R. E. Sasseville
B. Scheffler
J. H. Schell
E. A. Schlaginhaufen
W. C. Sessions
M. E. Yumlu
A. H. Shein
J. A. Sherman
A. Shuster
R. Smith
H. A. Strauch
O. P. Stroup
N. W. Taylor, Jr.
J. G. Templeton
B. E. Therrien
H. M. Tobin
D. W. Treimann
R. J. Tucci
F. P. Tully
H. H. Tyler, Jr.
M. Walker
G. Watt, Jr.
H. L. Weathers, Jr.
J. I. Weierman
P. P. White
J. W. Whitworth
D. Winslow
D. L. Wood
B. J. Wright, Jr.
E. M. Yelton

Members transferred to Senior Membership were:

D. W. Bruce
R. C. Davis
W. T. Haggerty
R. G. Hochschild
R. H. Johnson
J. C. Jordan
E. H. Keller
S. Lee
W. C. Privette
F. K. Quigley, Jr.

Respectfully submitted,
H. C. CHAPIN, *Secretary.*

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Royer to Speak at WNE Meeting

DR. George L. Royer, Calco Chemical Division, American Cyanamid Company, will be the speaker at the March 10th meeting of the Western New England Section. His subject will be "Scientific Aspects of Dyeing and Finishing."

The meeting will be held at Di Orio's Restaurant, 231 Bank Street, Waterbury, Connecticut. Dinner will be served at 7:00 P.M. and reservations, at $3.00 per plate, may be made with Robert N. Brownlee, U. S. Rubber Co., Naugatuck, Connecticut.

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South Central Meeting Date

LISTED below is schedule of meetings of South Central Section for 1950.

May 20—Hotel Patten, Chattanooga, Tenn.

August 18-19—Summer Outing—Read House—Hotel Patten, Chattanooga Country Club, Chattanooga, Tenn.

TRADE NOTES • NEW PRODUCTS

Dr. W. P. Munro

• Calco Appointments

K. H. Klipstein, Assistant General Manager in charge of the Technical Department, American Cyanamid Company's Calco Division, has announced the appointment of Dr. W. A. Raimond as Department Technical Director for Dyes, and Dr. W. P. Munro as Chief Chemist Department G of Dyes Manufacturing Division.

Dr. W. A. Raimond is a graduate of Rhode Island State College, with a B.S. degree in chemistry. He obtained his master's and doctor's degrees from Rutgers University, where he later worked as a graduate assistant in chemistry. He is a member of the American Institute of Chemical Engineers, American Chemical Society, and the American Institute of Chemists.

Dr. Munro is a graduate of the University of Iowa, with B.S. and M.S. degrees in chemical engineering. He obtained his doctor's degree in chemistry from Princeton University, was appointed a DuPont Fellow at Princeton in 1932-33 and later joined the Calco organization. He is a member of the Council New Brunswick Group, North Jersey Section of the American Chemical Society and a Fellow of the American Institute of Chemists.

Dr. W. A. Raimond

February Graduating Class at PTI

• PTI February Graduation

Commencement exercises of the Philadelphia Textile Institute were held Saturday, February 18, 1950, in the auditorium of the William Penn Charter School on West Schoolhouse Lane, Germantown, Pa. These exercises honored the first class to graduate under the new charter for the Philadelphia Textile Institute and the first to have had classes in the new home of the school at Schoolhouse Lane and Henry Avenue.

Dr. Ivor Griffith, president of the Philadelphia College of Pharmacy and Science, was the principal speaker. Degrees were awarded by Rinaldo A. Lukens, president of the Corporation of the Philadelphia Textile Institute. Director Bertrand W. Hayward presented the hoods and Dean Richard S. Cox presented the honor awards to the graduates.

The following received the Degree of Bachelor of Science in Textile Engineering:

Alexander, Edward E., New York City
August, William E., New York City
Becker, Herman, Philadelphia, Pa.
Campbell, Gordon A., Toronto, Canada
Chiarelli, Paul P., Brooklyn, N. Y.
Cohen, Herman, Brooklyn, N. Y.
Dievers, John C., Norristown, Pa.
Fishman, Ernest, Mt. Vernon, N. Y.
Folgeman, Jerome A., Brooklyn, N. Y.
Garvin, Eugene E., Alfred, Maine
Gluckstern, Allan Jay, New York City
Grossman, Manuel, Mexico City, Mexico
Harrigan, John M., Ridgewood, N. J.
Hogg, Norman G., Almonte, Ontario, Canada
Kirsch, George J., St. Albans, L. I., N. Y.
Leary, Joseph J., Beaver Meadows, Pa.
Lederer, Theodore R., Brooklyn, N. Y.
Peffall, Ross C., Westmont, N. J.
Pilzer, Paul, Brooklyn, N. Y.
Pribble, Chester H., Woolrich, Pa.
Prince, Wesley L., Jr., Glen Rock, N. J.
Rodway, Robert E., Harrison, N. Y.
Rubin, Lewis, Easton, Pa.
Ryan, James P., Brooklyn, N. Y.
Thomas, Ralph W., Jr., Pittsburgh, Pa.
Watson, Ronald C., Westmont, Montreal, Canada
Weinstock, Lionel L., Rockaway Park, N. Y.
Welsh, Thomas E., Philadelphia, Pa.
Witthohn, Donald B., Brooklyn, N. Y.

The following received a Bachelor of Science in Textile Engineering with a Chemistry, Dyeing and Printing Option:

Firsching, Henry W., Jamaica, L. I., N. Y.
Holweger, Christian W., Philadelphia, Pa.
Jerome, Jack W., Forest Hills, L. I., N. Y.
Manheim, Theodore B., Philadelphia, Pa.
Mansfield, Richard G., Philadelphia, Pa.
Putinier, Rene A., Beacon, N. Y.
Spring, Murray E., Toronto, Canada
Sugarman, Bernard, Brooklyn, N. Y.
Sutcliffe, Allen B., Philadelphia, Pa.

• Butterworth Adding to Bethayres Plant

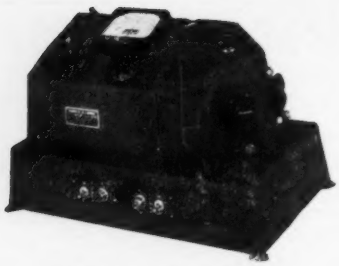
A new $300,000 addition to the Bethayres (Pa.) Plant of H. W. Butterworth & Sons Company is being hurried to completion and reportedly will be ready within twelve months for occupancy as an assembly floor, sheet metal shop, press roll department, general offices, purchasing and accounting departments.

The company, which announced the permanent closing of their truck foundry recently, has made public preliminary figures on 1949 operations showing an 11 per cent increase in profit over 1948, despite a substantial loss on foundry operations.

Preliminary figures, still subject to audit, show that the firm made a profit before taxes of approximately $624,970 in 1949, according to John H. S. Spencer, Treasurer. The firm's products include textile finishing machinery and rayon spinning machinery.

The Butterworth foundry was closed on the recommendation of a firm of management engineers who found that it was not economical for Butterworth to make their own castings. Late in 1949, the foundry was reported to be operating at only 50 per cent of capacity. The studies made by the engineers also show that the cost of moving finished parts from Bethayres to Philadelphia for assembly was excessive, especially on export shipments which had to be returned to Bethayres for crating.

In line with these recommendations, Butterworth will move their erecting shop from Philadelphia into the foundry building at Bethayres shortly.



I. D. L. "Color-Eye"

• Color Matching Instrument

Color-Eye, a precision color matching instrument said to be five times more sensitive than the human eye, is now available for users in textile, dye and other fields from Instrument Development Laboratories, 163 Highland Ave., Needham Heights 94, Mass. Originally developed for the research laboratory of the Pittsburgh Plate Glass Company, the instrument reportedly uses a combined electronic and optical computing system to simulate the response sensitivity and discrimination characteristic of the human eye without the eye's variance in perception.

In operation, Color-Eye automatically "accommodates" itself to the illumination level of the samples being compared, it is stated.

The range of automatic accommodations of Color-Eye is claimed to be such that sensitivity exceeds that of the human eye for variations in brightness of 10,000 to 1, permitting comparison of samples reflecting only 2% to an accuracy of ½% of reflected light.

For evaluation of tristimulus color values relative to standard whites, Color-Eye is equipped with a mitrometric slit and direct reading scale from 0 to 100%. To insure that surface conditions and illumination are comparable to visual measurements prior ot actual color measurements the samples may be examined with the Sample Viewer. This accessory, which fits into the transmission slide, is said to be useful in making precise measurements of many types of surfaces, particularly where dark colors are encountered.

The instrument will handle samples from ½" in diameter up.

• Calise's Paper Available

V. J. Calise, Technical Director of Graver Water Conditioning Company delivered a paper to the Tenth Water Conference of the Engineers' Society of Western Pennsylvania at Pittsburgh, Pa. last year. His subject was the results obtained from organic zeolites in the hydrogen cycle with acid regeneration. In addition to presenting the operating data from several commercial hydrogen zeolite installations based on Mr. Calise's experience, the paper explains the applications of acid-regenerated zeolites, compares sulfonated coal type and resin type zeolites, and discusses the various factors involved in establishing conclusions as to the effectiveness of this method of water softening, including silica removal.

The paper has recently been published as an article, with tables of results obtained and charts showing the characteristics of these zeolites. Copies can be obtained by addressing Graver Water Conditioning Co., Dept. 182, 216 West 14th Street, New York 11, N. Y., and asking for Article TA-115.

• Supplementary Literature on Mitin FF Conc.

Literature on Geigy Company's durable mothproofing agent, Mitin FF Conc., has been enlarged on, and brought up to date recently with the addition of three new booklets:—

1. "Mitin FF Conc."
   This booklet contains the general properties, fastness properties, and method of application for this product.
2. "Biological Aspects of Insect Damage to Wool."
   A complete picture of insect damage to wool, from a biological standpoint, is given in this booklet.
3. "62 West 2nd Street."
   This booklet is designed to give a brief history of the facilities available to Mitin consumers.

Copies of these booklets are available to interested parties by writing to Geigy Company, Inc., 89-91 Barclay St., New York 8, N. Y. or any of the branch offices.

• Rato-Chlor Chlorine Dispenser Catalog

An eight-page illustrated catalog describing the company's improved line of Rato-Chlor chlorine dispensers has been published by the Fischer & Porter Company, 61 County Line Rd., Hatboro, Pa. These units are said to accurately, safely and automatically meter, control and dispense chlorine. A dry vacuum system is employed and safety is assured by automatic shutdown on vacuum failure, the company states.

Self-contained cabinet-type units with capacities ranging from one to 1200 pounds of chlorine per day are described as well as systems which are claimed to have unlimited dispensing capacity which retain the advanced design and safety features of the cabinet type units.

Ask for Catalog 61.

• Tennessee Eastman Appointments

Appointments of John B. Gillis as Traffic Manager of Tennessee Eastman Corporation, and H. T. Verbridge as Assistant Traffic Manager, have been made public by the company in Kingsport, Tennessee. Mr. Gillis, former assistant manager of Traffic, has served as acting head of the department for several months, following the resignation of R. C. Caldwell as manager.

Mr. Verbridge succeeds to the assistant-managerial post vacated by Mr. Gillis. Prior to this, Mr. Verbridge was a rate analyst in the department.

• Plastics Exposition News

A display of more than 100 case histories of the industrial and commercial uses of plastics will be unveiled in Chicago on March 28, according to The Society of The Plastics Industry.

The presentation is now being prepared and will be shown for the first time at the National Plastics Exposition in Chicago's Navy Pier March 28-31. It will include both static and animated exhibits. Exhibit space already contracted reportedly exceeds that of the 1948 New York show. Dale Amos of Edinburg, Ind., general manager of Amos Molded Plastics, is chairman of the Exposition committee.

A specific theme for the exposition, "Plastics build better products and better values", has been announced.

It was announced simultaneously that the Society will sponsor a Conference at the Stevens Hotel in Chicago the mornings of March 29 and 30. At the Conference, from 9:30 to 12:30 each day, nationally-recognized authorities will discuss distribution, merchandising, marketing and selling. The conference's central thought will be that plastics have a decade of opportunity during 1950-1960.

The Chicago Sales Executive Club will have a "Salute to Plastics" dinner at the La Salle Hotel on the eve of the Exposition, Monday, March 27.

The Society is also sponsoring a case history display which will give a background of achievement for the new products, processes, and machinery to be exhibited by more than 100 firms. Carrying out the Exposition theme, each case history will show the industrial or consumer product before and after the application of plastics, will illustrate each use of plastics in it, and will describe the effects on weight, appearance, costs, manufacturing procedures, and merchandising.

Charles A. Breskin, New York publisher of Modern Plastics, is chairman of a special committee for the display and for the Merchandising conference.

• Epichlorohydrin Booklet Available

A revised 55-page booklet on epichlorohydrin has been published and is now available on letterhead request from Shell Chemical Corporation, 500 Fifth Avenue, New York 18, New York or 100 Bush Street, San Francisco 6, California.

The physical properties, including azeotropic data, of pure and commercial epichlorohydrin are tabulated for easy reference. The booklet describes the chemical behavior of epichlorohydrin with many organic substances, including aldehydes, ketones, alcohols, Grignard and other organometallic compounds, phenols and carboxylic acids.

Of interest to the chemist is the bibliography, which contains over 250 references. In addition, there is a brief discussion on storage and handling.

• New Acid Blue

American Aniline Products, Inc., 50 Union Square, New York 3, N. Y., announces the release of Alizarine Brilliant Blue R, a new level dyeing, acid blue, considered by the manufacturer to be of extreme brightness.

This new color is applicable to woolen and worsted piece goods and yarns from the normal Glauber's salt and sulfuric acid bath. It can also be applied by the top chrome procedure, having all around good fastness properties but of a somewhat duller cast, it is reported.

This color, it is stated, has no domestic prototype as far as is known. Bulletin No. 112 is available on request.

• Wool Bureau Outlines Research Problems

Recommendations for research designed to meeting existing technical and production problems in the woolen and worsted industry have been compiled by Giles E. Hopkins, technical director of The Wool Bureau, Inc. His findings were released Monday, January 23, by the Bureau in a booklet entitled "Suggested Research and Development Studies for the Woolen and Worsted Industry."

The program is based on an eight-month survey of research centers and wool textile mills supporting their own research departments in this country. It contains recommendations for research considered by Mr. Hopkins to be essential to maintaining the leadership of the American wool textile industry.

Among the specific problems analyzed and recommended for research by Mr. Hopkins are:

For mill processing: "Wool Scouring and Wool Grease Recovery," "Chemical Modification to Give Whiter Wools," "Lubrication of Wool Fiber for Processing," "Cause of Difference Between Skein and Top Dyed Yarns," "Device to Tie In Warp Beams," and "Carbonization."

In the field of laboratory tests and standards: "Laboratory, or Miniature, Reproductions of Mill Processing Equipment," "Simplified Tests for Wool Fiber Characteristics," "Wool Dermatitis and Allergies," "Sorption of Gases by Wool," "Electrostatics," and "Effect of Heat, Moisture and Time on Fiber Quality."

Product development research: "Scientific Design of Wool Fabrics" and "Protective Clothing."

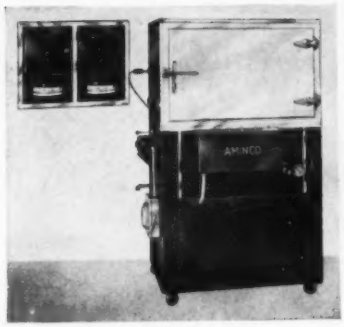
In the field of production and marketing: "Elimination of Black Fibers from White Wool" and "Improved Containers for Shipping Wool."

• Photovolt Reflection Meter

The Photoelectric Reflection Meter Model 610 of Photovolt Corporation, New York, N. Y., is finding application for color specification and color matching of fabrics. The instrument is specifically designed for the requirements of routine work in practical production control but also furnishes results of satisfactory accuracy for the research laboratory.

The Reflection Meter is built into a portable wooden housing with cover and carrying strap. For actual use, the search unit comprising the light source and the photocell is taken out from its compartment in this housing and placed directly on the fabrics to be measured. It is connected to the instrument proper by a flexible cable which makes it possible to move the search unit from one sample to another so as to go through a large number of samples in rapid succession. The readings are obtained directly as the indication of a needle on a meter scale. They are thus independent of the color judgment of the observer and can be reproduced from one operator to another. Since the search unit is equipped with its own light source, the results are also said to be independent of illumination or daylight conditions.

With the aid of a special set of filters, the readings reportedly can be obtained in terms of the color system usually referred to as tristimulus system or ICI Standard Observer for Colorimetry. Calibrated enamel plaques are available for standardizing the instrument. A built-in constant voltage transformer provides stable readings even where the line voltage is subject to considerable variation it is stated. The instrument can also be furnished for operation from a storage battery of the automobile type and manipulation of the instrument is simple and does not require any particular training on the part of the operator, according to company reports. Detailed instructions are furnished with each instrument.



Aminco Test Apparatus

• Humidity-Temperature Test Apparatus

Precision controlled variations of humidity and temperature reportedly can be repeated periodically, according to a predetermined program, by means of a new test apparatus recently announced by the American Instrument Co., Inc., Silver Spring, Maryland.

Standard apparatus provides three humidity-temperature program schedules of interest to government laboratories and manufacturers supplying equipment to the government, namely: (1) U. S. Signal Corps Standard Cycle No. SC-D-16286-B (except for the sub-zero phase); (2) U. S. Navy Specifications JAN-M-745; (3) U. S. Signal Corps Standard Cycle No. ES-D-65103-A (except for the sub-zero phase). Apparatus for other program schedules is available.

The apparatus consists of a test chamber, an air-conditioning unit, and a special control system.

Average maximum rate of rise of dew-point temperature (between 60° and 160°F.) is reported at plus 0.45°F. per minute, without load.

Average maximum rate of fall of dew-point temperature (between 60° and 160°F.) is reported at minus 0.75°F. per minute, without load.

Average maximum rates of rise and fall of dry-bulb temperature is said to be equal to or greater in magnitude than for dew-point temperature.

Details are given in manufacturer's Bulletin 2176, which is available upon request.

• Chairman, Chemical Division, Legal Aid Society

Herbert B. Woodman, President of Interchemical Corporation, has accepted for the third consecutive year the Chairmanship of the Chemical Division of the Legal Aid Society's annual campaign. Mr. Woodman will also head the Paints and Printing Inks Division of the campaign. The Society is asking for $200,000 to carry on its work of advising and representing those who cannot afford the services of an attorney.

Westvaco Alkali "Tanker"

• Westvaco Service Truck

A new, two-compartment alkali "Tanker" has been put into service by the Westvaco Chemical Division, Food Machinery and Chemical Corp. to serve caustic soda and caustic potash customers in New York, New Jersey & Philadelphia metropolitan areas. Pressurized compartments of 1175 and 1750 gallons reportedly can be discharged by air from tractor-driven compression. The tanks are insulated and steel jacketed for combination deliveries of KOH or NaOH.

• Maurice Lee Retires

Maurice du Pont Lee, general advisor to the Chief Engineer of the Du Pont Company, has retired after a career of nearly 42 years with the company. He has been engaged in engineering and development work for Du Pont since 1908.

Mr. Lee played an important part in developing the domestic dye and rayon industries and became manager of the technical division of the Rayon department in 1936.

He has been a director of the Old Hickory Chemical Company since 1928, was vice president from 1929 to 1939, and has been president since 1939. He will continue in that capacity. Mr. Lee was named general advisor to the Chief Engineer in 1946.

Born January 10, 1885, at Washington, D. C., he was graduated from Cornell University in 1908 with the degree of mechanical engineer. Mr. Lee joined Du Pont that same year as an assistant purchasing agent.

He is an advisor to the School of Engineering of Princeton University and is President of the Park Commission, a Director of the Boys' Club, and Recreation Promotion and Service, all of Wilmington, Del. He is a member of the Wilmington and Du Pont Country Clubs and Sigma Phi Fraternity.

• NAFTF Executive Committee Elections

The National Association of Finishers of Textile Fabrics elected the following to three year terms on the executive committee at their 36th annual meeting: William Beery, Riegel Textile Corp., New York, N. Y.; W. A. Broadfoot, The Aspinook Corp., Jewett City, Conn. and H. M. Burke, Lockwood-Dutchess, Inc., Wappingers Falls, N. Y.

The following were elected to one-year terms expiring January, 1951: Robert Amory, Springs Mills, Inc., Lancaster, S. C.; J. M. Cole, Cold Spring Bleachery, Yardley, Pa.; N. B. Durfee, Lincoln Bleachery & Dye Works, Lonsdale, R. I.; J. B. Farrell, Defiance Bleachery, Barrowsville, Mass.; W. O. Ferssell, Slatersville Finishing Company (Kendall Co.) Walpole, Mass.; G. D. Harrison, Lewiston Division, Pepperell Manufacturing Co., Lewiston, Me.; A. O. Joslin, Rock Hill Printing and Finishing Company, Rock Hill, S. C.; Lawrence Marx, Jr., Clearwater Finishing Co., Clearwater, S. C.; A. G. Odell, Kerr Bleachery & Finishing Works, Concord, N. C.; Julian Robertson, North Carolina Finishing Company, Salisbury, N. C.; J. A. Simmons, Lanett Bleachery & Dye Works, West Point, Ga.; B. I. Ward, Bellman Brook Bleachery, Fairview, N. J. and R. W. Ward, Providence D. B. & C. Co., Providence, R. I.

In addition to the above, the following members of the executive committee continue to serve unexpired terms, as follows:

Term expiring January, 1951: J. K. Milliken, Mount Hope Finishing Co., North Dighton, Mass.; C. B. Hayes, Pacific Mills, Lyman, S. C., and A. L. Garfinkel, Lowell Bleachery, Inc., St. Louis.

Term expiring January, 1952; T. A. Adams, The U. S. Finishing Co., Norwich, Conn.; W. R. MacIntyre, Jos. Bancroft & Sons Co., Wilmington, Del.; G. E. Sinkinson, Sayles Finishing Plants, Inc., Waylesville, R. I.

• Data Sheets on Alum

Three new Technical Data Sheets—Ammonia Alum, Potash Alum and Aluminum Sulphate (Iron-Free)—were issued this month by Ca. Tennant, Sons & Co., New York, and are available, with samples, upon request.

The Technical Data Sheets describe a particularly high quality brand of products manufactured in a new plant of Peter Spence & Sons, Ltd., England, now being distributed in this country by Tennant.

The ammonia and potash alum are presently available in granular form, packed in 100 lb. paper-lined burlap bags. They can be supplied in U.S.P. grades, if required. In the near future, the material will be offered in other forms.

The Spence-Tennant aluminum sulfate is an iron-free grade, creamy white in color. It is sold in 14%, 17% and 22% concentrations of Al_2O_3 in lump, granular and powder form. This product also is available as a commercial grade where iron-free quality is not essential.

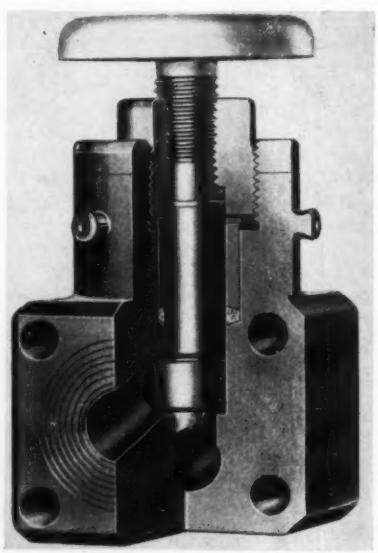
• "Karbate" Corrosion-Resistant Globe Valve

The "Karbate" Brand Impervious Graphite globe valve announced by National Carbon Division, Union Carbide and Carbon Corporation, 30 E. 42 St., New York 17, N. Y., is designed for shut-off and throttling service with corrosive fluids free from abrasive solids. Except for the Teflon packing, all valve parts in contact with the fluid are "Karbate" Impervious Graphite.

The reported features of the new globe valve, which comes in 1" and 2" sizes,, are its resistance to practically all corrosive chemicals (including hydrochloric acid, dilute sulfuric and hydrofluoric acids and chlorinated organic compounds) and to thermal shock. Because of the excellent thermal conductivity of impervious graphite the valve may be readily heated from a steam coil of copper tubing wrapped around it, when heating is required for handling highly viscous or saturated solutions, the manufacturer states.

The tapered disc value seat reportedly assures accurate and close control of fluid flow, and is self-reseating. The valve is light and small, has short face to face dimensions and is self-lubricating. Sturdy and compact construction ensure long life, trouble free operation and ease of installation, it is stated.

A copy of *Catalog Section M-8803A* is available.



"Karbate" Globe Valve

Herbert Griesinger and Lew E. Oakley, Directors of Canadye Corporation

Chauncey E. Allard

• Canadye To Represent Hilton-Davis in Canada

Appointment of the Canadye Corporation, Hamilton, Ont., as its exclusive representative on all dyestuffs and intermediates to the textile, paper and leather industries in Canada has been announced by the Hilton-Davis Chemical Company Division of Sterling Drug, Inc.

Nelson S. Knaggs, vice-president in charge of sales for Hilton-Davis, in announcing the appointment, declared it was part of the division's continuing expansion program in the dyestuffs field for which special Southern and New England representatives were previously named. There is a growing market in the Dominion for the Hilton-Davis basic dyes, acid dyes, naphthols, fast bases, and fast color salts, he said.

The Canadye Corporation is a division of French Dyestuffs, Ltd., and is directed by Herbert Griesinger and Lew E. Oakley. To provide speedy service to customers, stocks of Hilton-Davis products will be carried at strategic points throughout Canada and technical services will be rendered from the Canadye application laboratory in Hamilton, Ont.

French Dyestuffs, Ltd., will continue to represent the Societe Saint-Denis and Establissements Kuhlmann, both of Paris, France, manufacturers of agricultural and industrial chemicals, but will no longer represent the combined dyestuffs producers of France operating under Government control.

Mr. Griesinger, a native of the United States, has been president and manager of French Dyestuffs, Ltd., since 1942. Mr. Oakley also has been with French Dyestuffs, Ltd., since 1939.

• McNabs To Operate New Plant

William S. and Jack McNab have announced that they will begin operation of their own plant at 4143 Kingston Pike, Knoxville, Tenn. about March 15. Both have resigned from O. F. Zurn Co., Philadelphia, Pa.

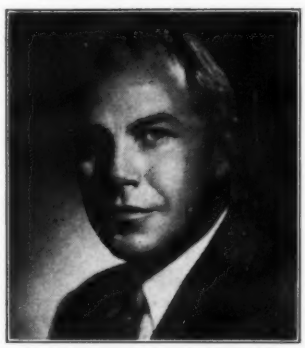
William McNab had been Southern Manager of Zurn's Knoxville plant for 20 years. His connection with the company exceeded 25 years. He is a charter member of the South Central Section, A.A.T.C.C.

The new company will be called the Mac Chemical Company and will sell a line of textile chemicals for dyeing, bleaching and finishing.

• Arnold-Hoffman Research Heads

Arnold, Hoffman & Co., Incorporated, has announced additional Research and Sales Service Laboratory facilities. They state that the program will provide better service for its line of dyestuffs and textile chemicals, enlargement of its Sales Service Laboratories and development of chemical products for new fields.

Dr. Carl E. Barnes has been appointed Director of Research and Chauncey E. Allard, Associate Director.



Dr. Carl E. Barnes

Dr. Barnes was formerly Associate Director of the Central Research Laboratory of General Aniline and Film Corp. Prior to this he was employed by the Polaroid Corporation and the Norton Company, working in the fields of optical resins and polymers, respectively. Dr. Barnes was graduated from Bates College in 1930 and received his Doctorate in Organic Chemistry from Harvard University in 1935.

Mr. Allard has been with Arnold, Hoffman & Co., Incorporated, since 1942, being in charge of general research since 1948. Prior to 1942 he was employed by Schering Pharmaceutical Corporation. Mr. Allard was graduated from Rhode Island State College in 1936, receiving his Master's Degree in 1938.

The expansion is aimed at diversification in the Arnold, Hoffman & Co. Incorporated line of products and improved customer service.

• ACC Chemical Data Compilation

The New Products Development Department of American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y., has announced the publication of "Collective Volume I" a compilation of data on several new chemicals which have become available from the company's research laboratories during the last year, and on which separate bulletins have been issued. Some of the chemicals covered are: aryl biguanides, guanylurea salts, beta chloropropionitrile, dialkyl cyanamides, glycolonitrile, lactonitrile, succinonitrile, and potassium cyanate.

Copies are available upon written request.

• Hydrogen Peroxide Booklet

Hydrogen Peroxide solutions of 27.5%, 35%, and 50% concentration are described in a new booklet prepared by the Buffalo Electro-Chemical Company, Inc. It contains a compilation of physical data and properties of hydrogen peroxide, lists a number of its reactions in organic and inorganic chemistry, and enumerates its applications and uses. Information on engineering materials, shipping containers, analytical methods, and physiological properties is also included.

Copies are available on request from the Buffalo Electro-Chemical Company, Inc., or its Sales Agent, the Becco Sales Corporation, Station B, Buffalo 7, New York.

CRL Deeminizer

• Portable Mixed-Bed Ion-Exchanger

Water virtually free from ionized impurities can now be produced quickly and at low cost by the new mixed-bed technique of ion exchange operated in a miniature exchange unit. According to its manufacturer, the Crystal Research Laboratories, Inc., of Hartford, Conn., the apparatus weighs 5½ pounds and requires one-third of a square foot of bench space. To the worker in operating, research or school and university laboratories, the apparatus reportedly offers a ready supply of high-quality water for preparing stock solutions and for the scores of laboratory operations normally dependent on distilled water.

The Deeminizer, as it is called by its manufacturer, is said to yield up to five gallons per hour of water equal in chemical quality to triple-distilled. Fed with ordinary tap water, it can deliver a product with an electrical resistance of 10 million ohms, it is stated.

It represents the first commercial application of the mixed-bed ion exchange technique announced recently by researchers at the Resinous Products Division of Rohm & Haas Co., Philadelphia chemical manufacturer. The instrument itself consists of a rigid polystyrene tube which accommodates a replaceable container filled with Deeminite, a mixed bed of specially converted Amberlite exchangers. The tube is mounted on a gray metal base, measuring 6x8 inches, which houses the meter.

In operation, a jar of water is up-ended in the top of the tube; the water passes through glass-fiber filters which remove physical impurities, then through the bed of resins which adsorb the ionized impurities. The output is drawn off through a polyvinyl hose in the base.

A built-in electrical conductivity meter shows the purity of the effluent and indicates when to replace the cartridge. In soft-water cities the manufacturer estimates that one-million-ohm water may be produced for approximately five cents per gallon; in other areas the estimated cost would be 25 cents.

• Soap Buying Guide

The 1950 Handy Soap Buying Guide has been published by the Colgate-Palmolive-Peet Company. Designed to be a help in solving present day washing, cleaning and processing problems, the Guide presents a resume of the Colgate-Palmolive-Peet line of soaps, synthetic detergents, cleansers, washing powders, bar and dispenser soaps, including sizes and units available. Product descriptions, packs and other useful information are provided.

The free guide may be obtained from any Colgate-Palmolive-Peet representative or by writing to the Industrial Department, Colgate-Palmolive-Peet Company, Jersey City 2, N. J.

• Bradbury Heads Hewson Division

The John Hewson Company, 106 Water Street, New York, has announced the expansion of its rubber and plastics division to handle all standard and special application problems of its customers. Harry Bradbury has been appointed as specialist and consultant in charge.

Fred R. Geib

• National Assignment for Geib

Fred R. Geib, technical representative in the Midwestern area, of the Dowicide Division, The Dow Chemical Company, has been assigned similar duties on a national basis, W. A. Melching, manager of Dowicide Sales, announced recently.

Mr. Geib will work closely with the chemical sales force in the company's sales offices throughout the United States and be concerned with developmental problems involving bactericides and fungicides which are used in the paper, leather, paint, textile, lumber, oil and other industries.

To better facilitate his new duties, he will move from Midland to Chicago.

• Smith Medal to Schiefer

The H. D. W. Smith Medal of Committee D-13, A.S.T.M., will be awarded to Herbert F. Schiefer, Textile Section, National Bureau of Standards, at a meeting to be held on March 16th at the Park Sheraton, New York. This will be the first award of the Medal and presentation will be made at 2:00 P.M.

The H. D. W. Smith Medal has been endowed by the Fabric Research Laboratories in honor of Dr. Smith and will be awarded annually or at longer periods. It will be awarded for outstanding achievement in, or contribution to, the science of the utilization of textile fibers, including development and promotion of knowledge of textile fibers and structures, or methods for evaluation of their properties.

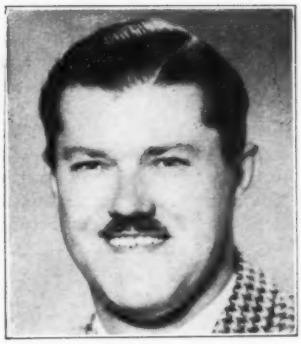
Following the presentation of the Medal, three papers on "The Dimensional Stability and Shrink-proofing of Textiles." will be presented as follows:

Edward C. Pfeffer, Cluett, Peabody & Co., "Cotton."

Jackson A. Woodruff, American Viscose Corporation, "Rayon."

Claude S. Clutz, Forstmann Woolen Co., "Wool."

All persons are welcome to attend this session. Other meetings of Committee D-13 are scheduled for March 15th and 17th at the Park Sheraton.



Jack Ferguson

• Ferguson Heads Technical Sales Staff

Colloids, Inc., manufacturers of textile chemical specialties, has announced the appointment of Jack Ferguson, former head acetate dyer at Antipyros Co., Brooklyn, N. Y., to its technical sales staff.

Mr. Ferguson has had 18 years of dyeing experience.

• Instrument Course

April 10 to 14, inclusive, is the period of the second quarterly instrumentation course for 1950 conducted by the Fischer & Porter Company at its Hatboro, Pennsylvania plant.

Manufacture, calibration, installation, operation and maintenance of the company's line of process control instruments will be covered in the course.

Additional information can be obtained by writing to the Fischer & Porter Company, East County Line Road, Hatboro, Pennsylvania.

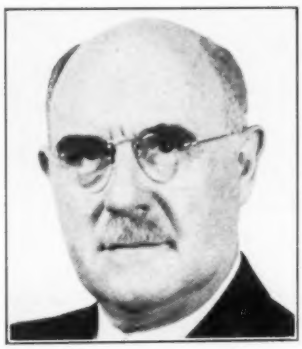
• USSR Journal of Applied Chemistry to Appear in English Translation

Complete English translation of the *Journal of Applied Chemistry of the U.S.S.R.* will be available to American research laboratories and libraries, beginning with the January(1950 issue, Consultants Bureau, 153 West 33 Street, New York 1, New York, has announced. Subscribers to the English translation will receive complete translation of each 1950 issue within 7 weeks after its arrival in this country, and several months in advance of the abstract literature. Subscription to the entire Vol. XXIII (1950) of the *Journal of Applied Chemistry of the U.S.S.R. in English translation* is $80.00.

The Journal of Applied Chemistry of the U.S.S.R. will be translated simultaneously with the *Journal of General Chemistry of the U.S.S.R.*, which Consultants Bureau is also publishing in English translation.

• Calco Announces Management Appointments

S. C. Moody, Vice President and General Manager of Calco Chemical Division, American Cyanamid Company, has named Quintin T. Dickinson as Manager of the new Coal Tar Chemicals Department, established to handle all purchases and sales of coal tar chemicals and their by-products; W. C. Harmon, Jr., as Manager of Purchasing of the Calco Chemical Division with headquarters at Bound Brook, N. J., and B. W. Henderson as Manager of the Intermediate and Rubber Chemicals Department.



Quintin T. Dickinson

Mr. Dickinson obtained his degree of Bachelor of Science in Chemical Engineering from the University of Pennsylvania in 1917. He joined the Calco Chemical Sales Department in 1928 and in 1934 transferred to the Purchasing Department, becoming General Purchasing Agent in 1942.

W. C. Harmon, Jr.

Mr. Harmon is a graduate of the Sheffield Scientific School of Yale University, receiving his Ph.B. in Chemistry in 1915. He joined the Calco organization in 1929 and since 1932 has been associated with the Sales Department.

Mr. Henderson, identified with the rubber industry since 1906, came to the American Cyanamid Company in 1934 as manager of the Rubber Chemicals Department, and in 1947 became manager of the Calco Rubber Chemicals Department. He

B. W. Henderson

was formerly Vice President of F. R. Henderson & Company, and from 1924 to 1933 President of Bancroft W. Henderson & Company, rubber importers. He is past chairman of the Board, Rubber Trade Association, an associate member of the Rubber Division, American Chemical Society.

• GPA Booklet

"Why Glycerine for Textiles?", a booklet published by the Glycerine Producers' Association, combines basic technical data of concern to the chemist with facts about usage for the non-technical buyer.

Pointing out that glycerine's humectant and plasticizing action play important roles in textile application from sizing to finishing and printing, the 12-page work outlines the general reasons for glycerine's use, and gives further information as to its physical and chemical properties, origin and development. Included are tables of specific gravity, viscosity, freezing point, etc., of aqueous glycerine solutions at various concentrations, and a bibliography of references.

This booklet has been prepared with the assistance of technical consultants, and the research laboratories of the Glycerine Producers' Association. Copies can be had free on request to the Glycerine Information Service, 295 Madison Avenue, New York City, 17.

• OTS Bibliographies

New bibliographies on creasing and water-repellency of textiles are discussed in a brief review released by the Office of Technical Services of the U. S. Department of Commerce in the "Technical Reports Newsletter", February issue.

The bibliographies, prepared by the Army Quartermaster Corps to assist in the advancement of textile research, contain descriptive summaries of principal papers on these subjects as far back as 1937.

Copies of the issue are available on request from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., or from U. S. Department of Commerce field offices.

R. J. Herman

• Atlantic Moves Herman to Chicago

The Chemical Products Section of the Atlantic Refining Company recently announced that R. J. Herman has been transferred to their Chicago office, located at 111 West Washington Street, Room 939. Mr. Herman will handle the Ultrawets, Atlantic's alkyl aryl sulfonate type synthetic detergents, and other Atlantic petroleum chemicals in the midwestern states.

• New Grade of Stainless Steel

Armco Steel Corporation, Middletown, Ohio has developed a new grade of precipitation-hardening stainless steel of interest to the chemical processing and allied industries. Known as Armco 17-7 PH Stainless Steel, the new alloy is reported to have a corrosion resistance closely approaching that of 18-8 stainless and a strength and hardness equal to those of high carbon spring steels. In addition, it has good fabricating properties and can be hardened by a low temperature heat treatment, the company states.

The alloy is recommended by Armco for such applications as pressure tanks, diaphragms and disks, all types of springs, conveyor parts, spring clips and washers. It is available in soft and hard temper flat rolled products as well as hard and extra hard temper wire.

The product, along with the company's recently announced 17-4 PH Stainless Steel, a bar and forging grade, make vailable a range of forms of these precipitation-hardening steels.

In a booklet, "Stainless Steel and Textiles," Armco explains the use of stainless steel to reduce costs and improve product quality. The booklet includes a table showing the resistance of stainless steels to corrosion by various dyestuffs and chemicals. Additional information is given in general recommandations on the use of 18-8 as well as Types 316, 317, 430, and extra-low carbon stainless steels.

Service records of stainless equipment installations, ten to fifteen years old, show the value of this steel for textile machinery and flow charts of textile operations indicate the units where stainless steel can be used to advantage. Also included in the pamphlet are helpful suggestions on the care and cleaning of stainless steel equipment.

• Burlington Gift of $20,000 to TRI

Burlington Foundation, a trust established by Burlington Mills Corp., has made a gift of $20,000 to the Capital Fund of Textile Research Institute, Inc., according to A. G. Ashcroft of Alexander Smith & Sons Carpet Co., President of the Institute. The gift, it was announced, will be used to pay for property and equipment which will aid the Institute to carry out its long-range research program.

W. Bailey Sellars, Vice President in Charge of Research & Development of Burlington Mills Corp. said in presenting the gift on behalf of the Burlington Foundation, "the contribution signifies the importance which Burlington Mills attaches to long-range textile research and the confidence which it holds in the ability of the Institute to carry it out."

"The Institute's Capital Fund," explained Mr. Ashcroft, "was set up several years ago and is often associated with the late Harold De Witt Smith through whose untiring efforts it was built to a level which permitted acquisition and equipping of the T.R.I. laboratories in Princeton. With increasing demands by the industry for long-range research, additional equipment is constantly needed. Hence, the Institute Directors are seeking contributions to the Capital Fund with the object of having available funds to meet the rapidly developing industry-wide program under the direction of Dr. J. H. Dillon, Research Director."

• NETF Opens Fourth Campaign

New England Textile Foundation, 68 South Main Street, Providence, R. I. announces that its Fourth Campaign for the benefit of the textile schools in New England started in February with 18 initial gifts and pledges totalling $43,125.00—an average of $2,395.00 per contributor. The campaign will continue through the balance of the year until the goal of $250,000.00 has been realized or until all possibilities have been exhausted. The schools which benefit from the Foundation program are Bradford Durfee Technical Institute of Fall River, Mass.; Lowell Textile Institute of Lowell, Mass.; New Bedford Textile Institute of New Bedford, Mass., and The Textile School of Rhode Island School of Design, Providence, R. I. Money contributed to these schools by the Foundation is used for the purchase of new modern equipment, the subsidization of faculty salaries, and for scholarships, to attract the highest type of student and make a textile education available to students who would be unable to continue their education without such financial assistance. The Foundation reports that since December 5th, 1944, when it was established, through September 30th, 1949, it has donated $490,578.31 for these purposes.

Contributions are solicited from the textile and related industries in New England and in other states which are served by the textile schools of New England. At present 26 different states are represented by the enrollment in the four New England schools, with the great majority of the students from outside of New England coming from New York state and New Jersey.

Contributions should be made out to New England Textile Foundation and mailed to the Foundation at 68 South Main Street, Providence 3, R. I.

The Foundation reports that it has available for distribution on request a booklet illustrating and describing the equipment which it has donated to the textile schools in New England during the last two years, a breakdown of appropriations made in 1949, an analysis of the 1949 Campaign, a report on scholarships, a list of contributors in 1949 and a detailed financial statement.

E. D. Walen, Vice President of the Worsted Division, Pacific Mills, Lawrence, Mass., is General Chairman of the 1950 Campaign.

• Protective Coatings Bulletin

The Atlas Mineral Products Company, 41 Walnut St., Mertztown, Penna., has announced Bulletin 7-1 on Protective Coatings for industry, containing information on coatings suitable for protection against corrosive fumes or splash on steel, concrete and wood surfaces. Available on request.

• Proctor Check Test Preboarding Machine

In a new catalogue, Proctor & Schwartz, Inc., Seventh St. and Tabor Rd., Philadelphia 20, Pa., discusses the Proctor Check Test Preboarding Machine. The equipment makes possible a quick check on how stockings will appear after preboarding without processing them on a full scale preboarding machine, it is reported. It is also said to provide a quick means for checking shades in the dyehouse, where dyed stockings are to be finished in steam under pressure.

R. & L. Cooking and Storage Tank

• Sizing Tanks Added to Riggs & Lombard Line

The addition to the line of stainless steel size cooking and storage tanks has recently been announced by Riggs & Lombard, Inc., Suffolk St., Lowell, Mass., manufacturers of textile wet finishing and drying equipment.

The stainless steel tanks are available in several sizes and are insulated with a stainless steel jacket on the outside. The top is partially hinged and equipped with clamping bolts. Built for heavy duty, the paddles have top and bottom bearings and are driven through a geared-end motor drive and a right angle gear box. There is a choice of either open or closed type heating coils. The tank bottom is of dished construction with a suitable drain outlet.

Further information can be obtained by writing directly.

• New Pycnorator Instruments

A new line of Pycnorator instruments for measurement and control of fluid density and specific gravity has been introduced by the Fischer & Porter Company, 76 County Line Rd., Hatboro, Pa. Among the designs available are submerged float instruments for use in vessels under pressure or vacuum, open bubblers, closed diaphragm and hydrometer types. F&P Pycnorator instruments are also available which operate in conjunction with the Ranarex specific gravity measuring system.

The instruments are illustrated and described in an eight-page catalog 76, copies of which are available.

• Millmaster Chemical Agent

Millmaster Chemical Corporation, 420 Lexington Ave., New York 17, N. Y., has been appointed exclusive agent for the sale of Wollastonite, a calcium metasilicate, and Diopside, a calcium magnesium metasilicate, according to an announcement by the Willsboro Mining Company, Inc., Willsboro, N. Y.

Willsboro, after having devoted a number of years in the development of mining properties in and around Willsboro, N. Y. under the guidance of Koert Burnham, has completed the construction of a beneficiating plant directed by Payson Hatch in the same locality. The purpose of this investment has been to make commercially available unlimited quantities of various grades of multi-purpose industrial silicates at prices low enough to encourage a wide range of applications.

Horizons, Inc., 2891 East 79th Street, Cleveland, Ohio, of which Dr. E. Wainer is Research Director, are serving as Research Consultants for the products being mined and beneficiated by Willsboro. Ceramic applications have been assigned to William M. Jackson II, ceramist.

Samples and prices are available upon request.

• National Chemical Exposition Set For September 5-9

The Sixth National Chemical Exposition by the Chicago Section of the American Chemical Society will be held in the Chicago Coliseum September 5-9. Dr. Marvin C. Rogers, Research Director of R. R. Donnelley and Sons Co., who is chairman of the committee in charge, expects a very successful exposition.

Dr. Rogers has announced the names of the members of the Exposition Committee who will assist him in planning and conducting the show. These are: Dr. George G. Lamb, Technological Institute of Northwestern University; Orville G. Linnell, R. R. Donnelley and Sons; Dr. T. U. Marron, A. B. Dick Co.; Dr. C. S. Miner Jr., The Miner Laboratories; A. E. Schneider, The Armour Laboratories; Dr. H. W. Schultz, Swift & Co.; B. N. Rockwood, Swift & Co., and H. F. Schwarz, Sherwin-Williams Co. Details of the Exposition will be handled by the manager, James L. Doheny, newly appointed manager of the Chicago Section of the ACS. Since 1946, Doheny has been in charge of arrangements for national meetings of the American Chemical Society.

The Exposition, running concurrently with the 118th National Meeting of the American Chemical Society in Chicago, which is expected to have a registration of over 10,000 itself, is expected to attract over 50,000 persons, it is stated.

Leon E. Moody

• Moody Appointed Manager at Valley

M. E. Binz, President of The M. E. Binz Company, Limited, of Montreal, has announced the appointment of Leon E. Moody as Manager of the Valley Dyeing & Finishing Company, Limited, at Valleyfield, Quebec. This plant does all the dyeing, printing and finishing of The M. E. Binz Company Limited, rayon dress and shirting fabrics.

Mr. Moody is a Lowell Textile Institute graduate and an experienced rayon dyeing and finishing plant manager. He was formerly with U. S. Finishing Company at Sterling, Connecticut, and F. P. Maupai Dyeing Company, at West New York, N. J.

Mr. Moody also spent several years with American Cyanamid Company, Textile Resin Department, as head of their technical service laboratories.

• Blumenthal Elected to TRI Board of Directors

Andre Blumenthal, Vice President, Sidney Blumenthal & Co., has been appointed Chairman of the Executive Committee of the Board of Directors of the Textile Research Institute, Inc., according to an announcement from the New York City offices of the Institute by its President, A. G. Ashcroft, Director of Research, Alexander Smith & Sons Carpet Co.

As Chairman, Mr. Blumenthal will direct the activities of the committee, which meets regularly and considers policy matters for the regular monthly Board of Directors meeting. Mr. Blumenthal succeeds Kenneth Wilson, Vice President of Forstmann Woolen Co., who has held the chairmanship for fifteen months. He asked to be relieved of the leadership due to added responsibilities following the death last month of Curt E. Forstmann, President of Forstmann Woolen Co.

Mr. Blumenthal has been a member of the Institute's Board of Directors and Executive Committee for four years.

• Zurn Shifts Personnel

The O. F. Zurn Company, Philadelphia, has announced the appointment of Richard O. Trost as Southern Manager of its plant in Knoxville, Tenn. Long associated with the Zurn office in Philadelphia, Mr. Trost's permanent headquarters will now be Knoxville, where he will supervise Zurn's service to Southern textile industries.

Allan M. Sergeson has been appointed representative for Tennessee, Georgia and Alabama. With offices in Charlotte, N. C., Mr. Sergeson formerly covered North and South Carolina territory for Zurn.

Both men will have roles in shaping of a sales drive with particular emphasis on Zurn's newer products already under way in the South.

Among Zurn's recent innovations in the textile conditioning field is its latest product to be announced to knitters—Bleached Glycering Softener CUK one solution only for prevention of "shiners." With this solution and other research-developed products, company officials state that Zurn is in a better position than ever to serve Southern textile men with the highest quality, most up-to-date chemicals and oils for all their conditioning requirements.

• Inco Exhibit at Cleaning and Dyeing Convention

International Nickel Company, Inc. will feature corrosion resisting equipment for laundry and cleaning and dyeing equipment at the 41st annual convention and exhibit of the National Institute of Cleaning and Dyeing in the North Building, Navy Pier, Chicago, Ill., March 12th to March 15th.

Included will be Monel equipment for handling synthetic dry cleaning solvents. The company will also show sand and precision castings for compenent parts of such equipment.

The booths, Nos. 570-572, will be in charge of C. J. Bianowicz and A. C. Zino.

• Fox Awarded Scholarship

George W. Fox of Randleman, N. C., a junior in the School of Textiles at N. C. State College, has been awarded an Owens-Corning Fiberglas Corporation Scholarship for two years of study.

The scholarship, valued in excess of $1,000, covers the tuition and fees for both the junior and senior years and provides an additional expense allowance of $50 per month during a 20-month period.

The Owens-Corning Fiberglas Corporation has also extended Fox an opportunity to work in one of its plants during the summer of 1950. The corporation, however, does not place any obligation upon the holder of the scholarship to accept employment upon graduation.

• AATT Members Visit O-C Plant

More than 60 members of the American Association of Textile Technologists, Inc., visited the Textile Products Division plant of Owens-Corning Fiberglas Corporation in Ashton, R. I., February 3. The group included members of the association from the New York City area and New England.

The visitors toured the plant and were shown the various operations necessary to make Fiberglas yarns from marbles of glass. They saw the "forming room" where the marbles are reduced to a molten state and then drawn into fine filaments, and viewed operations of the Ashton Textile Processing Laboratory, after which they witnessed a recent basic textile development of the Fiberglas Corporation, the coronizing of Fiberglas fabrics.

Dr. George E. Linton, dean of the Textile Department of Fashion Institute, New York, N. Y., president of the association, headed the group on its sixth field trip.

Acting as hosts for the Fiberglas Corporation were John H. Thomas, vice president and general manager of the Textile Division, and Harry Jones, plant manager.

• Adkins and Beauregard Join HRL

Allen Adkins, a graduate of Emory and Henry College, and Lawrence Beauregard, from the University of Vermont, have joined the staff of Harris Research Laboratories, 1246 Taylor St., N.W., Washington D. C.

• 1950 Fall Woolen Colors

Half Century colors hold the spotlight in the advance confidential woolen collection for Fall 1950, released by the Textile Color Card Association to its members. Featured in this sports range are Green Glitter, Gaiety Blue, Dramatic Red, Dynamic Green, Lush Violet, Pink Glamour, Blue Flight and Golden Era.

Eight tones captioned "Wintermist Pastels" are named to reflect their character. These comprise Shadowhite, Pink Frost, Bluvapor, Icegold, Silverglo, Snowgreen, Blondmist and Mauvehaze.

Reds include Redblaze and French Garnet. More bluish in tonality are Harvest Rose and Rhone Wine. Mauvish tinges are reflected in Rose Plum and Lilac Pink. The beige to brown runs include Toasted Muffin and Coral Brown. More restrained in tonality are Beigebark and Teak Brown. The copper, rust and spice range includes Cinnamon Rust and Copper Capucine.

Blues include Wild Duck, Cloudy Blue, Blue Sunset and Dusky Blue. Purplish shades feature Crayon Mauve and Vatican Violet.

Greens are represented by Mello Aqua, Green Laurel, Bronze Olive and Terrapin Green. Completing this collection are two neutrals, Burnished Silver and Midnight Grey. The forty new colors will all be presented in the Regular Edition of the 1950 Fall Woolen Card to be issued later.

OBITUARY

CHESTER L. EDDY

CHESTER L. EDDY died recently in Greenville, S. C., at the age of 69. He had been identified with the textile industry in that area for the past 20 years.

Mr. Eddy was superintendent of Renfrew Bleachery at Travelers Rest, S. C., for a number of years and formed the Eddy Chemical Co. 7 years ago in Greenville. A member of the American Association of Textile Chemists and Colorists, he was active in the affairs of the Piedmont Section and had served as its Chairman.

Mr. Eddy is survived by his widow, a daughter, a son and a brother.

EUGENE H. AECKERLE

DR. EUGENE H. AECKERLE, Chief Chemist of Bellman Brook Bleachery Co., Fairview, New Jersey, died last August 16th of a heart attack.

Dr. Aeckerle had been with Bellman since the early 1930s. He had previously been with the Apponaug Company, United States Finishing Company, and the old Rockland Finishing Company.

He was one of the original refugees from Bolshevism, having been imprisoned in Russia after the first World War. While he was in this country he did all he could to aid others who were in the same plight.

Dr. Aeckerle was a member of the New York Section of the American Association of Textile Chemists and Colorists.

• Tests and Standards Approved by RFC

The Rayon Fabrics Committee of the American Standards Association, sponsored by the National Retail Dry Goods Association, has approved work completed by its subcommittees on minimum quality standards for rayon fabrics for 50 different end uses in wearing apparel for men and women and for home furnishings and on test methods. The standards will cover both piece goods and fabrics in finished textile articles. They now go to the national organizations that are members of the committee for study and vote on acceptance. In general, proposed standards provide means of determining the performance of fabrics containing more than 50 percent rayon in terms of reproducible tests. The tests have been selected and developed from existing methods of such agencies as the American Society for Testing Materials, the National Bureau of Standards, the American Viscose Corporation, the Federal Specifications Board, and the American Association of Textile Chemists and Colorists. Measurable qualities include water absorbency, water repellency; breaking or bursting strength; color fastness, when subjected to laundering, sunlight, perspiration, dry cleaning and pressing; shrinkage in laundering; crease resistance; permanence of finish. The committee approved plans to develop tests for wear resistance.

Since the technical work is now completed, a subcommittee is starting work to develop a nationwide program to put the standards into use. Harold Merahn, Sales Promotion Manager and Vice President of Gertz Department Store, Jamaica, is chairman. The sub-committee's proposals will be submitted to the Rayon Fabrics Sectional Committee for approval.

Gordon Creighton, Assistant General Manager and Assistant Treasurer of the National Retail Dry Goods Association, offered his resignation as vice-chairman of the Rayon Fabrics Committee. He is retiring May 1. Henry G. Leef, Divisional Merchandise Manager, Woodward and Lothrop, Washington, is the new vice chairman of the committee.

• Protecto-Grid

The manufacture of a product known as the Protecto-Grid has been announced by The U. S. Stoneware Co., Akron, Ohio.

The Protecto-Grid fits in the bottom of the sink or on the drainboard and acts as a "cushion" between the sink and the glassware. It is said to protect fragile laboratory glassware from possible breakage.

The product is an expanded piece of metal completely covered with Tygoflex, a member of the Tygon family. Tygoflex is said to be tough, resilient, and resistant to acids and alkalies, but not chlorinated hydro-carbons, ketones or esters.

Protecto-Grids are available in sizes to fit virtually any sink or drainboard.

• Two New H-D Labs

Two new research units have been opened at the Cincinnati plant of the Hilton-Davis Chemical Company Division of Sterling Drug Inc. One is a combined office and laboratory for Dr. Donald Hirtle, director of the division's research laboratories. Both this unit, and the other newly opened space, are designed to amplify existing facilities to further research on and development of new intermediates, dyes and pigments, according to Dr. Hirtle.

ABSTRACTS

Control of Quality in a Rayon Piece Dyeing and Finishing Works

R. A. McFarlane and C. C. Wilcock, Journal of Textile Institute 40, P583-607, July, 1949.

A comprehensive method of control of quality in a rayon piece dyeing and finishing plant is described with particular reference to a vertical textile manufacturing organization. It is suggested that at least parts of the method described can be applied with advantage in commission dyeing and finishing plants.

The method involves liaison with all sections of the textile industry concerned with the production and sale of finished fabrics, close contact with research and development work, careful check of all raw materials, and rigid control of all processes. It is stressed that liaison, testing, control, etc., should not be carried to absurd or unnecessary limits, but should be applied where advantage can be gained. Further, it is conceded that occasions arise when control must be sacrificed on the grounds of economics or practicability. The method described is illustrated by examples and a number of the limitations are mentioned.

The importance of research and development is stressed, with emphasis on anti-shrinkage, crease resistance, etc. This is a valuable paper and should be of interest in all rayon finishing plants.—W.H.C.

Specialty Fibers

H. S. Haigh, Journal of Textile Institute 40, P794-813, August, 1949.

"The fibres known as specialty hairs mainly consist of cashmere, camel hair, alpaca, vicuna, and mohair. Then there are those hairs which are described as fur fibres and which cannot be included. These specialty hairs are not easy to define by comparison with wool. They possess little or no felting property and the fibres generally are straighter and smoother than wool. They possess more lustre and the surface of each of these fibres has its own characteristic appearance and scale formation. These surface features enable the scientist to identify the fibres and distinguish one from another. They all differ from wool, being softer, and furthermore, with the exception of mohair they are usually of natural colour, including a small percentage of white."

After discussing each of the above-mentioned fibers at considerable length the author concludes: "You will no doubt appreciate that the fibres mentioned in this talk are without question specialty fibres. No other fibres are similar and wools generally do not make adequate substitutes for them."—W.H.C.

Practical Aspects of Wetting and Detergency

E. S. Paice, Journal of Texile Institute 40, P876-90, Sept., 1949.

The author remarks "One of the most striking developments in recent years in the field of applied physical chemistry has been the increased importance of the conception of wetting and detergency in industrial applications, coupled with the great expansion in the large scale production of suitable surface agents." He then considers the functions which these agents fulfil and surveys some of the more important types of synthetic wetting agents and detergents "to help in realizing why a particular material is se-

lected for a definite purpose."

The wetting agents described are: soap, sulfonated oils, alkyl sulfonates, alkyl esters and amides, alkyl sulfonates, petroleum sulfonates, cation-active compounds, and nonionic compounds.

The industrial applications discussed are to textiles, particularly wool; fur and leather; the laundry industry; cosmetics and pharmaceuticals; and the dairy and food industry.—W.H.C.

Fundamental Aspects of Wool Dyeing

P. Alexander, Canadian Textile Journal 67, No. 2, 49-55, Jan. 20, 1950.

In this important paper both scientific and practical aspects of the subject are treated. The author starts with a brief discussion of the morphological structure of wool, and then dwells at some length on the theory of dyeing and the factors which influence the affinity of the dye for the wool fiber, the rate of dyeing, and the wash fastness of dyes. He comments "Studies of the theory of dyeing—as indeed in all other chemical processes—may be divided broadly into those dealing with *rates*, that is, the kinetic approach, and those which are concerned solely with the equilibria set up when textiles are left long enough in the dye bath; that is, the thermo-dynamic approach. Both of these aspects are important in practical dyeing, since the rate influences the degree of levelness and the total time taken by the process, while the equilibrium position decides the 'fastness' to washing and, of course, the degree of exhaustion of the bath."—W.H.C.

Notes on the Indanthrene Type of Steamer

"Colourist", Textile Manufacturer 76, No. 901, 31-3, Jan., 1950.

"With the growth of screen printing the smaller types of steaming unit for colour fixation have found wide application, and amongst these the star frame steamer and the Indanthrene type of steamer have found considerable favor. Vat dyes, as well as the soluble leuco esters of vat dyes, stabilized azoics (by neutral and acid steam), mordant colors; acid and direct dyes by the Urea process and basic dyestuffs, can all be fixed more or less successfully by the proper use of the Indanthrene type of steamer. The cloth is wound on a perforated cylinder, which is then enclosed in an air-tight steel casing out of which the air can be driven by steam under pressure up to 7½ lbs. The steam can be moistened or cooled by atomized water sprays."

The author explains the advantages and disadvantages of this type of ager and gives many suggestions for carrying out the steaming operation.—W.H.C.

Efficient Steam Utilization in the Piece Dyeing and Finishing Trade

C. T. Wade, Textile Manufacturer 76, No. 901, 15-17, 40, Jan., 1950.

The author states "There is perhaps no branch of the textile industry which offers at once such scope for the waste of fuel and such opportunities for the efficient use of fuel as does the wool piece dyeing and finishing trade." He points out that the actual dyeing process is usually the largest steam consumer in finishing operations and enormous heat losses frequently result. He lays down several rules for the economical utilization of steam and suggests some of the main causes of excessive heat loss in the various operations in a piece dyeing and finishing plant.—W.H.C.

The Application of Rubber to Wool—II

R. W. Moncrieff, Textile Manufacturer 76, No. 901, 34-6, Jan., 1950.

This article discusses the treatment of woolen materials in an aqueous bath containing polymerized butadiene or one of its derivatives, also the use of methyl methacrylate co-polymers. The purpose of these treatments is to make the wool resistant to shrinkage on washing. Several U. S. Patents are cited, and various formulas for emulsifying the rubbery materials are given.—W.H.C.

The Waterproofing of Textiles

E. E. Halls, Textile Mercury & Argus, 122, No. 3172, 107-10, Jan. 20, 1950.

The author compares the moisture absorbency of various fibers and shows the relation of the moisture content of each fiber to the relative humidity of the air. Thus, e.g., cotton exposed to air at 60% r.h. contains about 6% by weight of water; at 80% r.h. it contains about 9% water. He then describes briefly 13 different methods of waterproofing, ranging all the way from a simple impregnation with aluminum hydroxide to actual coatings with wax, copper naphthenate, rubber, plastics, etc.—W.H.C.

Dyeing Properties of Nylon

"Colourist", Textile Mercury & Argus 122, No. 3170, 14-17, Jan. 6, 1950.

This article, which is the second in a series, deals with the application of the acetate rayon dyes. The author points out that "Nylon is a protein-like substance, but in one respect it differs considerably from the protein fiber wool. It is soluble in organic solvents, and so can behave as an organic solvent." He states that when dyeing is done with the acetate colors, the solid dye actually dissolves in the solid Nylon fiber, just as in the case of acetate rayon. The rate of dyeing of the different acetate dyes varies widely, he says; "some dyes were absorbed 60 times more rapidly than others."

He comments on the migratory power of these dyes, which permits them to become "redistributed" during the progress of the dyeing operation, so that a leveling action is produced. He compares the dyeing behavior of a number of acetate dyes on nylon and on acetate rayon, and remarks, "the shades produced on the two fibers by any particular dye are not identical."—W.H.C.

Decortication of Long Vegetable Fibres

S. A. G. Caldwell, Textile Recorder 67, No. 802, 62-3, Jan., 1950.

"The extraction of bast and leaf fibers is ordinarily an expensive process involving a considerable amount of labor. Disruption of long established sources of supply during the war years, and the difficulty of finding suitable substitutes, gave an impetus to developments in processes and machinery for extracting bast and leaf fibers which have effected considerable economies in production."

The author describes the operations of dew and water retting as applied to flax, and points out their relative advantages. —W.H.C.

Mangling and Drying Faults in Textile Printing

Anon. Textile Age 14, 104-12, Jan., 1950

This is "a detailed discussion of stenter mangles, tinting mangles, stained selvedges, creasing in mangling, iron and brass bowls, and similar matters pertaining to this phase of printing." The author states, "One of the causes of a lot of trouble in heavy print goods is the accumulation of surplus dyestuff and thickening transferred from the cloth during final drying. When heavy goods, such as dress linens or spun rayons, are being printed, it is the normal practice to dry out by passing the goods through a squeezing mangle and over a range of drying cylinders. Theoretically, the previous after-treatment or soaping will remove all surplus dyestuff and thickening, but in practice some slight residues are normally retained and may give rise to trouble if mangling prior to drying is not very carefully carried out."

The author gives a detailed discussion of this problem and suggests various remedies."—W.H.C.

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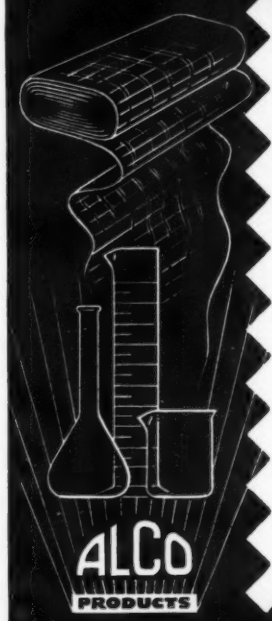

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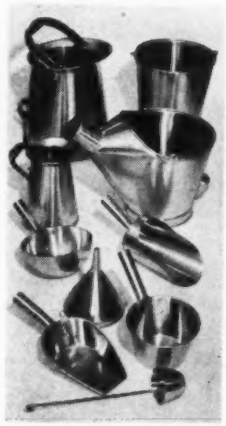

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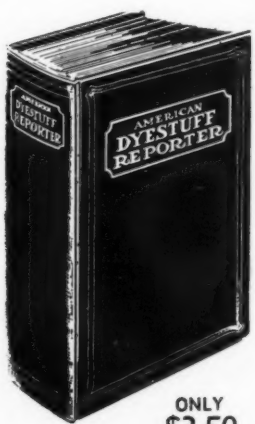

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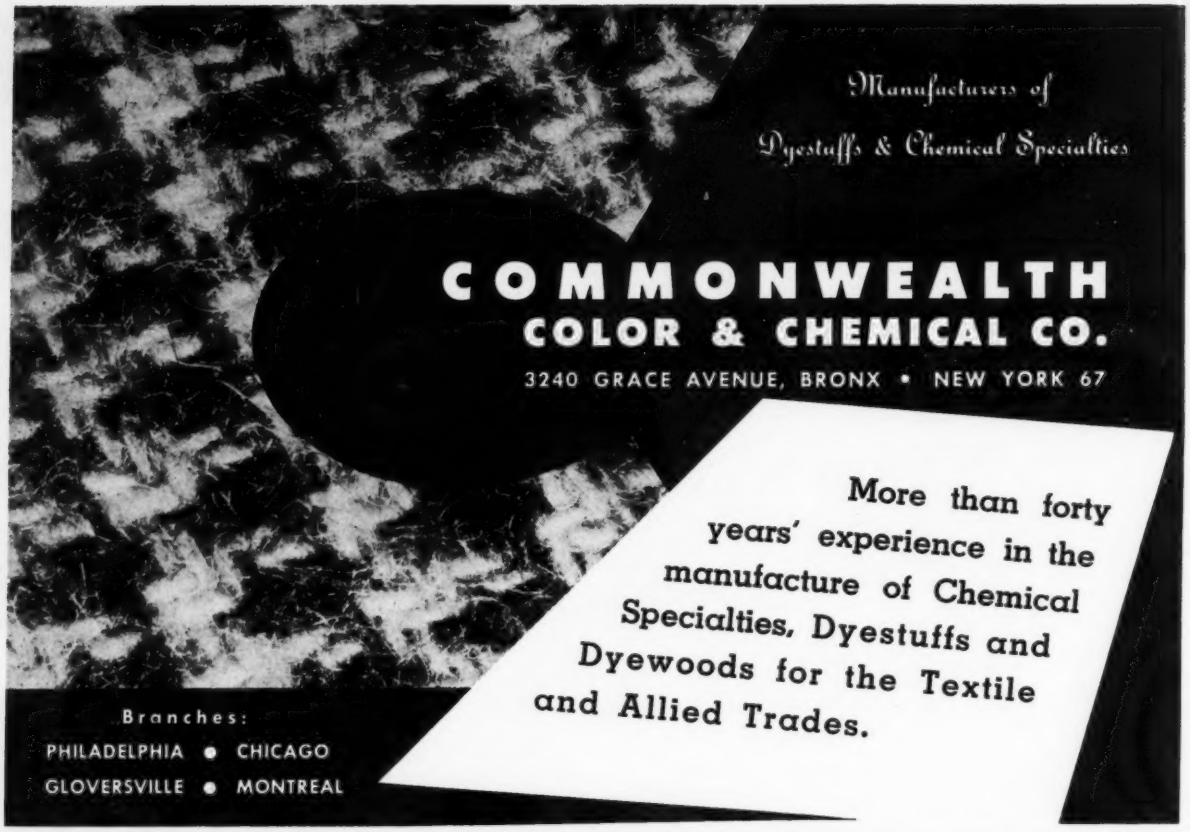
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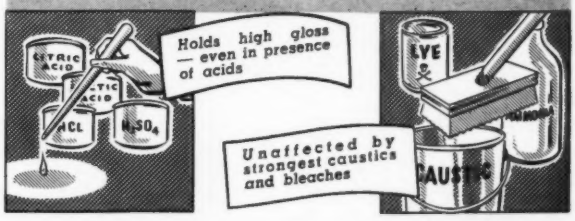

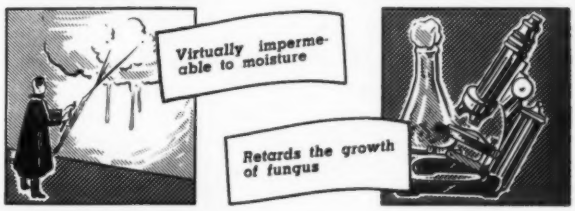

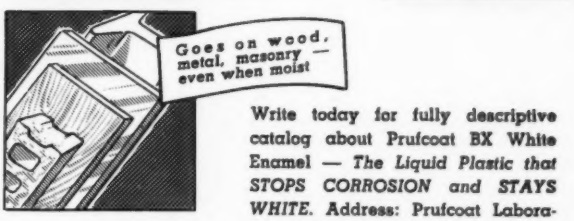

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WANTED: DYER-ASSISTANT, experienced on DOUBLE WOVEN cotton, nylon and rayon. Knowledge in dye chemistry necessary. Good opportunity for the right party with an old established company. Reply to DOUBLE WOVEN CORP. OF AMERICA, Sherwood & Reeves Street, Dunmore, Penna.

WANTED: Large established dye manufacturer has opening for a salesman in the East and one in New England. Also for an experienced technical service man. State age, experience and compensation expected. Write Box No. 795.

TEXTILE SALESMAN: Manufacturer of specialty compounds for sizing, finishing and printing desires aggressive salesman to call on textile trade in New York and New Jersey area. Please give details of experience, education and salary requirements. Write Box No. 796.

DYER: Progressive North Jersey piece dye plant wants a dyer to handle acetate, viscose, nylon fabrics and their combinations. Write Box No. 797.

POSITIONS WANTED: Ph. D., June, 1950. Major—organic chemistry. Minor—physical. Age—29. Married. Desires opportunity in textile industry in either research or development. Prefer east or south. Write Box No. 798.

POSITION WANTED: Textile Colorist with laboratory and plant experience in dyeing and printing cotton, rayon, acetate, nylon and mixed fabrics. Desires position as dyer. Capable of handling all types of dyestuffs. Write Box No. 799.

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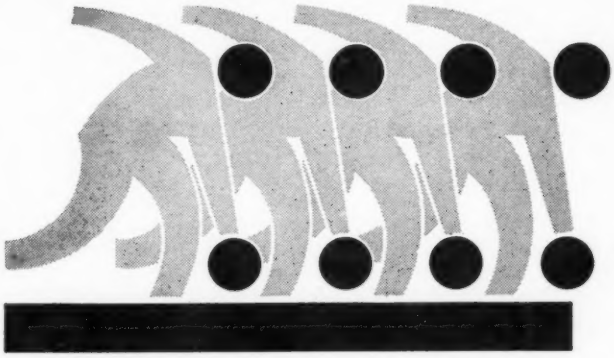

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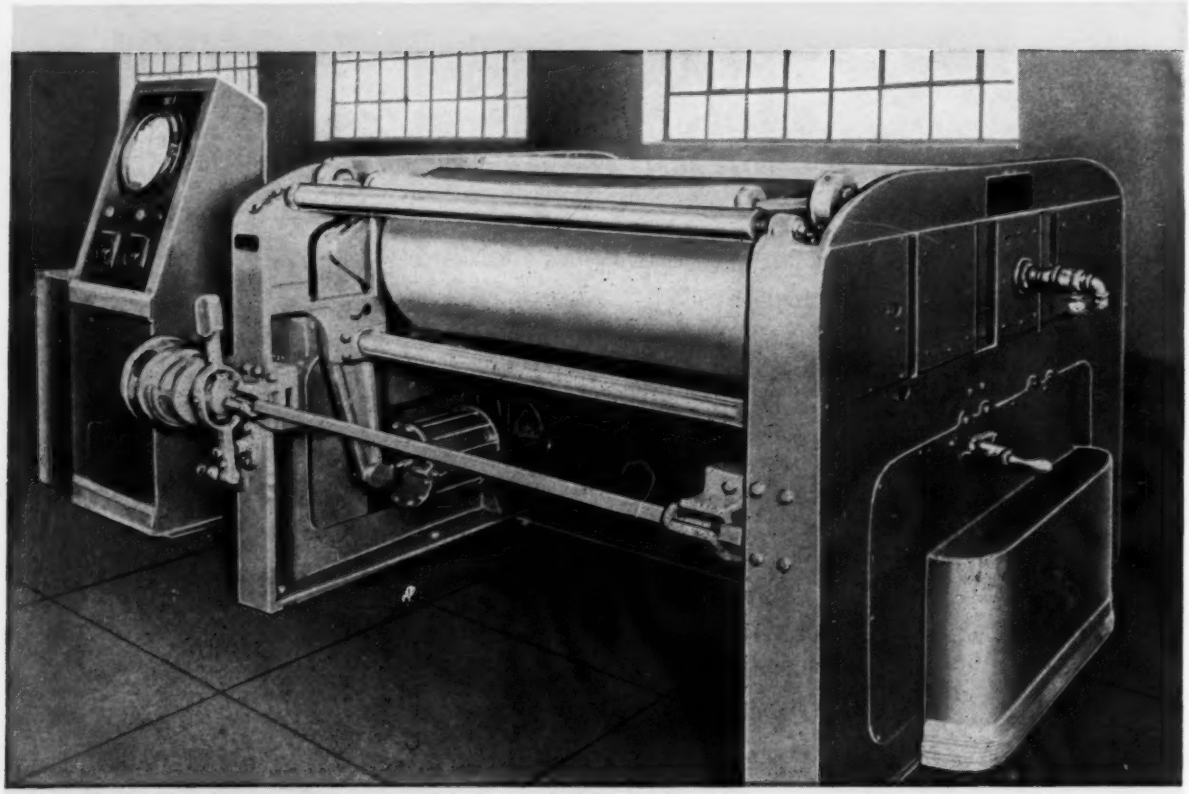

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